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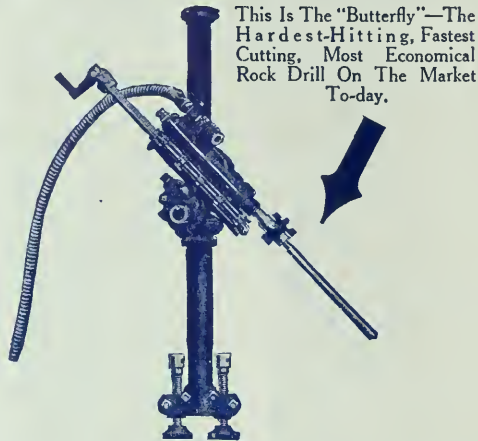
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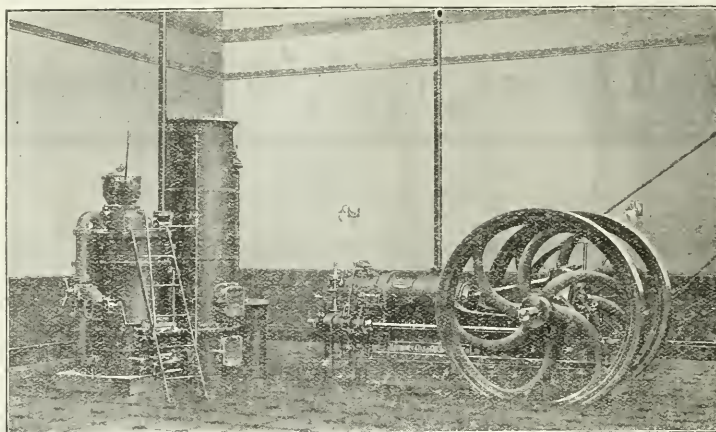
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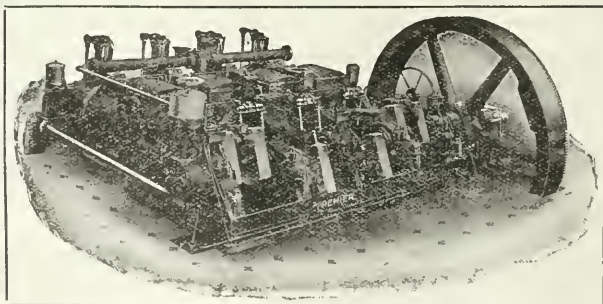
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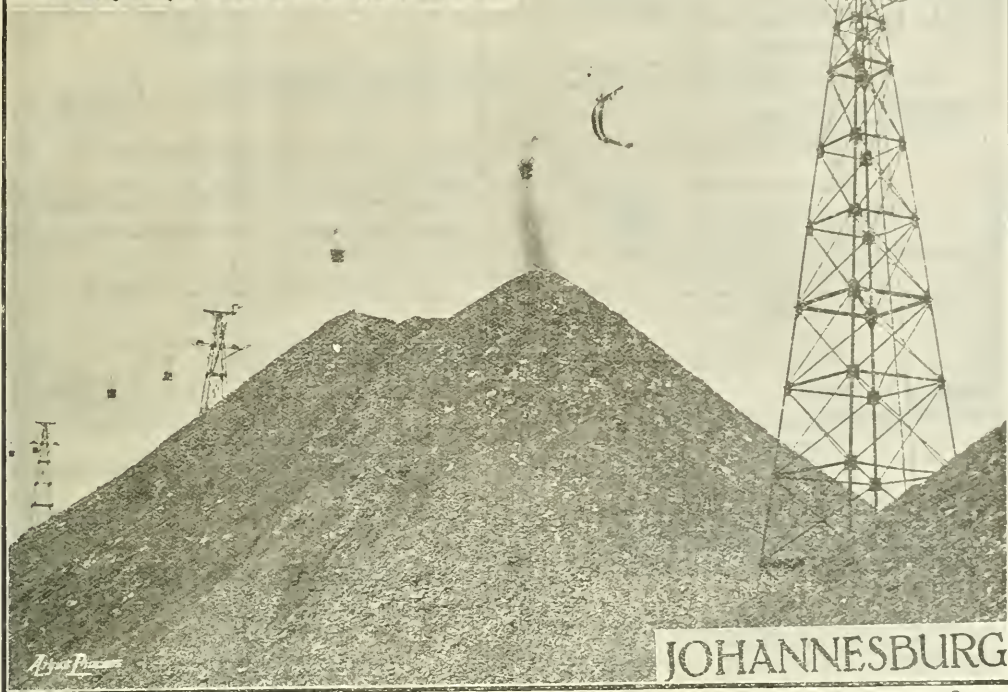
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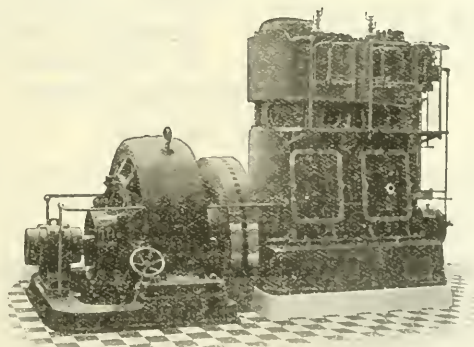


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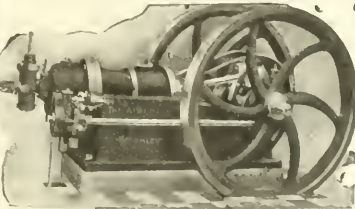
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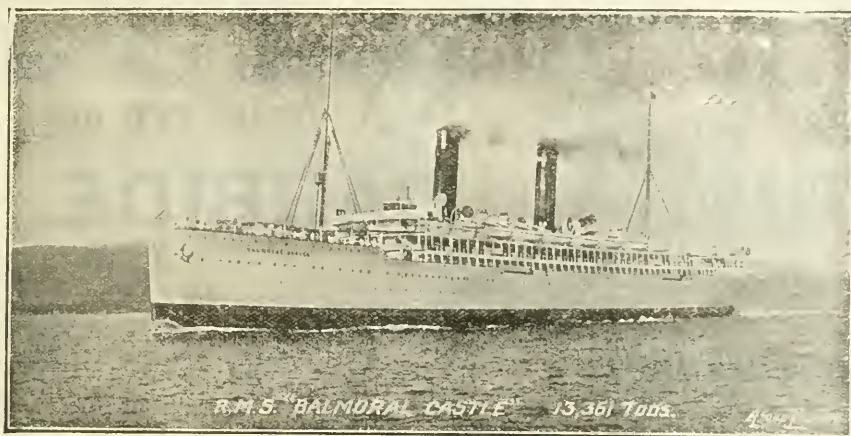
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Notes and News.

Much disappointment is felt in the Bloemhof district at the non-proclamation of the farm Blesbokfontein, which is regarded by many diggers as one of the most promising properties in the whole district, and one which has indicated its potential value as an alluvial diamond field by declaring outputs of a value exceeding £1,000 per month. It is felt that as Moofontein is a declining productive area, and furthermore as London has far from come up to expectations, the Government should do all in its power to increase the scope for diamond winning in the Bloemhof fields and proclaim all such legitimate propositions as offer reasonable prospects of affording livelihoods to diamond diggers. Apart from the question of affording occupation to the diggers, the Government obviously must benefit from revenue in respect of claim licences. As an instance of this, the case of Avondster may be cited. This farm, which adjoins Moofontein, recently was proclaimed. It never has been regarded as a very desirable digging, and the part of the farm proclaimed did not meet with the approval of the majority of diggers who knew it. Despite this, quite a number of men took out claim licences as soon as these were procurable, and the numbers since have increased. It is accordingly somewhat difficult to understand the attitude of the Mines Department in regard to Bloesbokfontein.

* * * *

In giving evidence before the Tuberculosis Commission this week, Dr. Robert England Kerr, who has sixteen or seventeen years' experience in Johannesburg, stated his conviction that mining regulations had now been improved

to such an extent that, if properly carried out, miners' phthisis should practically be non-existent soon. Speaking particularly of the Wolluter Mine, he stated that he went underground a good deal and he was more than surprised at the great improvement which had taken place in underground conditions. In addition to the use of water at the face, sprays were employed in the drives with highly beneficial results. About ten days ago he visited some of the blind ends, where one would expect at least to find a considerable amount of dust, and he had been astonished to find that there was practically no dust, simply because the mine management had insisted on thorough spraying with water. Witness expressed the belief that it was a good practice for medical officers to go underground to see that the health conditions were as good as they could be made. Asked if there were many cases of phthisis on the Wolluter Mine, Dr. Kerr said that he was not aware of any newly-developed cases. "In fact," added Dr. Kerr, "I can hardly imagine phthisis being possible under the present conditions."

* * * *

The Transvaal Chamber of Mines has submitted to the Small Holdings Commission answers to the questions put to the various mining companies by the Commission. The statement includes three tabulated forms, the summarised conclusions of which are, in relation to sixty-three companies, that there are 22,815 white employees, of which 10,987 are married and 11,828 are single men. The numbers of men subject to thirty days' notice is 2,639, while the number subject to twenty-four hours' notice is 20,176. They also show that married quarters are provided for 3,617 men, and that accommodation is provided (say two in a room) for 13,753 single men. The rentals charged vary from 5s. per man to 10s. per man and from 10s. to £1 per room, this including, in some cases, water, light, and sanitary service. Certain companies, apart from the accommodation already mentioned—for instance, the

Apex, Benoni Consolidated and New Kleinfontein mines—have put into operation schemes by which their employees can obtain houses of their own. Other mines have under consideration schemes by which the employees will be able to obtain residential sites in the vicinity of the respective properties.

* * * *

The Jupiter—the deepest mine on the Witwatersrand—has exhibited a highly satisfactory increase in profits during the past few months. **Improved Returns from our Deepest Mine.** In July the company crushed 41,550 tons of ore for a recovery of 9,841 ozs., and a profit of £2,483. At the end of that month the Company had 250 ozs. of gold in reserve. In August the profit improved to £3,565. The September operations resulted in the milling of 39,300 tons, but the output was 10,412 ozs., the profit £8,188, and 1,000 ozs. were added to reserve. Last month 42,800 tons were stamped, and 10,929 ozs. recovered, the profit amounting to £9,570, whilst the gold reserve was maintained at 1,250 ozs. There has, it appears, been a substantial improvement in the grade of ore milled. The much better results obtained from this deep deep level should assist in refuting the pessimistic assertions that have recently been made as to very deep level prospects.

* * * *

In discussing the vexed question of Rand mine lives, the *Revue Parisienne de Mines* states that it takes over the estimated lives given “in our excellent contemporary, the *South African Mining Journal*, of Johannesburg, which is a much better authority than London papers, as the latter often publishes contradictory calculations within the interval of a month, without any apparent reason.”

* * * *

In a note on a report attributed to Mr. H. Lyons in our last issue, we questioned the grounds for that gentleman's optimism regarding the value of the tin-lode on Apingendam. We have been favoured by Mr. Lyons with an explanation to the effect that he was incorrectly reported in the daily Press, and that his figures were only those of assays made from actual samples taken by him.

* * * *

A correspondent has written to us to the effect that the property of the Bellevue Tins is one of doubtful value. It should be understood that the information that has been published in this journal in connection with the undertaking has been distinctly reported as being supplied by the company.

* * * *

A local syndicate is now engaged in treating a considerable quantity of tailings—or rather “tailing”—on the Black Reef. A small plant is in operation near Natal Spruit, and is shortly to be added to. The syndicate proposes to deal with sand as well as slime, and is understood to possess excellent prospects of success. The many improvements that have been effected in metallurgy of recent years have, of course, rendered large quantities of mill residues on outlying propositions profitable; residues which in the early nineties—they now seem like the Dark Ages of ore treatment—could not be made to yield a profit. We anticipate considerable activity in this branch of mineral industry, both in the Transvaal and in Rhodesia, during the next year or two.

* * * *

This year's gold output easily will establish a record both for the Transvaal and the Witwatersrand. **Our Increasing Gold Output.** For the first ten completed months of 1912 the Main Reef series has contributed £80,923,511, and the outside districts £1,319,119, making a total for the Province of £82,224,633. At this rate of output the Transvaal's production for the full

twelve months will be in the neighbourhood of £88,700,000, as compared with £84,991,620 in 1911. Last year this country yielded 36 per cent. of the gold output of the world, which was estimated at 97½ millions sterling. Apart from South Africa, no other gold mining countries substantially increased their output last year. The majority of fields are in fact expected to exhibit a decline, and it is probable that the 1912 output of the globe will be much the same as that announced in respect of the 1911 operations. The Transvaal's percentage of output will thus in all probability be in the neighbourhood of 40 per cent.; in other words this year the Transvaal has yielded eight shillings of every pound produced in the world. As to the future, it is our firm belief that the Transvaal will increase this percentage. The excellent developments being secured in the deeper sections of the Central Rand and the remarkable results obtained on the further east section of the fields promise a very different future to the gloomy outlook portrayed by Mr. Hoover and others. We note that one or two eminent oversea mining men and at least one well-informed technical journal corroborate our modest optimism.

* * * *

The directors of the New Rhodesia Mines, Ltd., state that the results of the development work on the Kameel mine are distinctly encouraging. A winze has been put down from the 3rd level, and a crosscut at 400 feet has disclosed a value of 38 dwts. over 18 inches. This property now comprises 50 claims in all, and a 5-stamp mill has been purchased. The company has interests also in the Porcupine and Alaskan territories. The loss for the year ended May 31, 1912, amounted to £7,752, and after deducting the credit balance brought forward from the previous year a net debit of £4,137 remained.

* * * *

The Oceana Consolidated Company, Ltd., to June 30, 1912, secured a profit of £16,470, which, added to the balance brought forward from the previous year, made a total of £79,661. Investments appear in the balance sheet at a value of £774,317; loans to companies and others against securities, £293,040; loans against Stock Exchange securities, £28,874; and cash, £38,413. The loan account against the company amounted to £182,885. In consequence of the continued absence of speculative enterprise and an entire lack of public interest in mining ventures, all securities which exhibited a depreciation have been written down to market value, and no credit has been taken for appreciation shown by other investments.

* * * *

We regret that owing to unusual pressure on space the first portion only of our remarks on Mr. Rolfe's reply to his contribution on “Illogical Precision in Mine Reports” was printed last week. We here give the second portion, which was unavoidably held over:—There is admittedly something to be said in favour of Mr. Rolfe's argument, and in the bulletin of the Institution of Mining and Metallurgy to hand by this mail there appears his reply to the discussion, in which we think Mr. Rolfe has strengthened his case somewhat. In the course of this reply he states:—“In the original manuscript sent to the Institution, there was a concluding paragraph dealing shortly with the question of reporting mill tonnages, but I was disappointed to find that this paragraph had unfortunately been omitted in the published paper, as it formed an important part of the subject. It reads as follows:—‘In conclusion, a word must be said concerning the reporting of monthly mill tonnages. Taking into consideration the crude methods usually employed for weighing ore going to a mill, and the approximation in the measurements of the ore in the mill-bins at the beginning of each

Mr. Rolfe's Paper.

month, there can obviously be no great amount of accuracy in the tonnage treated. A Rand mine published 53,996 tons as milled during the month of last January, and a property in West Africa treated 9,999 tons in February. Each of these instances is inconsistent, the latter being particularly noticeable because the addition of one more ton would at least have saved a considerable amount of calculation in compiling the cost sheet, while the accuracy of the estimate of tonnage milled would not have been impaired. With regard to this question of measurements, I have quite recently come across my original notes, made when I first entertained the idea of writing a paper on this subject, nearly five years ago, but since mislaid. On going through these notes I find that there still remains a good trump card for me to play. This has reference to the fact that essential measurements in estimating ore reserves, viz., areas on the plane of the lode of blocks of ore, are taken from a plan which is drawn to some miniature scale, such as 1 in 500; the errors inherent to this system are many, and the following is a list of them:—(1) The actual admissible error in surveying the contour of the 'back' (or 'face') of a stope. The impossibility of making an accurate contour is acknowledged on the Rand, where the *Mining Regulations*, framed by the Government, tacitly admit that, in the event of a miner on contract disputing his square fathomage, the original area may differ by 3 per cent. from that measured by an independent surveyor, without penalising the accuracy of the first measurement; (2) Errors in plotting. The difficulties of pricking off decimals of a foot on a 1 in 500 plan are known to all surveyors; (3) errors in inking-in: which require no enlargement; (4) error in planimetry. This is due to the pointer of the planimeter not following exactly the line bounding the block to be measured; also, the thickness of the line introduces a perceptible error. On a 1 in 500 plan the thickness of a line may represent a measurement of from six inches to one foot. Taking the case of a block of ore having dimensions which, on the Rand, are by no means considered large, viz., 250 ft. by 500 ft., it is astonishing to find that the bounding line, if taken to have a width representing only 6 in., covers an area of approximately 21 sq. fath. Assuming that a sq. fath. is equivalent to 12 tons of ore, the thickness of the bounding line of but one block may thus be responsible for about 250 tons. (5) The error of the planimeter. This instrument is frequently checked on a regular figure of known area, but the planimeter is not infallible, and must not be relied on as giving absolutely accurate results. (6) The error due to expansion and contraction of the paper of the plan, on account of varying weather conditions. This is a most important source of error, and the effect it may have upon an area is obvious. Elsewhere in this issue we publish a letter from Mr. Rolfe on the subject.

* * * *

The annual report of the Jumbo Gold Mining Company, Ltd., shows a working debit of £27,491. **The Jumbo.** which, added to the previous loss of £8,112, makes a total debit of £35,603.

During the year £6,000 of debentures were redeemed, leaving a balance outstanding at June 30, 1912, of £18,000, and this has since been reduced to £11,000. Upon the recommendation of the consulting engineers, development work at depth ceased at the end of March last, owing to the poor results obtained. Development was carried out on the Jumbo reef, but payable values had disappeared, and this, combined with the company's financial position, forced the directorate to follow the advice of the engineers. The ore in sight at that date was 9,690 tons, averaging 9.57 dwts., which, compared with 30,803 tons, averaging 9.81 dwts., at the beginning of the year under review, makes, indeed, a poor show. It is difficult to give any accurate estimate of the life of the mine, but it is hoped that the present ore reserve upon stopping will prove to be under-estimated, and shareholders, meantime, will have to be satisfied with the fact that it is difficult to set any definite date as to the final shutting down of the mine.

TOPICS OF THE WEEK.

HOMES FOR MINERS.

The evidence given before the Small Holdings Commission was enriched last week by a notable contribution from Mr. R. W. Schumacher. Mr. Schumacher differs from the majority of the witnesses before the Commission in that he is at once genuinely anxious to forward the objects of the enquiry and is in a position to translate his sympathy into action. Among his general recommendations were that the Commission in its report should emphasise the desirability that wage-earners all over South Africa should be encouraged to found their own homes, and lay stress on the point that it would be well for the Government and the various Municipalities to take steps in this direction soon. He also advocated that every facility should be given to private employers, such as mining companies, to cede freehold title or the equivalent on easy terms to their employees; the underlying idea being always that the employees should build their own houses and live in them, and not use the land or houses for speculative purposes, or for purposes of revenue. It was undesirable, he considered, that any pressure should be exercised on private employers. More would be done voluntarily than under pressure. If any areas like those belonging to the City Deep, Ltd., and the Geldenhuys Deep, Ltd., are likely to come under the Townships Law and be incorporated in the existing municipalities, Mr. Schumacher advised that the necessary form of procedure should be hurried so that the men are not kept waiting too long. As far as the Witwatersrand is concerned, he urged that the Commission should not consider only ground which is in immediate proximity to the mines, or to existing suburbs. Railway facilities may render ground, which is slightly more remote and much cheaper, almost just as desirable in the near future. The greater part of Mr. Schumacher's evidence-in-chief was devoted to a description of the Geldenhuys Deep and City Deep schemes, which owe to him their existence. In the first case, the Geldenhuys Deep owns a large area of deproclaimed ground on the northern portion of the farm Elandsfontein No. 11, in the extension of the Doornfontein Valley, immediately beyond the township of Kensington and adjoining Sir George Farrar's farm. The company is now considering the eventual sale of about 1,800 acres of good ground which can be cut up into small holdings. The intention is to offer the freehold on attractive terms to men working on the Geldenhuys Deep, and then, also, to other men working on mines connected with Rand Mines, Ltd. No definite scheme has, as yet, been decided on. Mr. Schumacher said he was still undecided as to what was the best size for the holdings, whether they should consist of small agricultural lots of three or more acres, or whether, in view of the large demand that may arise if the land were offered cheap, the area nearest to town should be dealt with as residential lots, say, of one acre or half an acre in extent. The price that would be asked from the men would average about £25 per acre, exclusive of mineral rights, and there would probably be some additional contribution required if water has to be laid on. In neighbouring townships that are already served by trams, good lots 100 feet by 50 feet are being charged for at the rate of £100 to £130. This is equivalent to approximately £800 to £1,000 per acre. The comparison of price is interesting. This ground is well situated for small allotments of land. It is close to the mines, close to the town and north of the reef. It would be possible to cut it up into larger lots, but this would mean reducing the number of families whose need for a home would be met.

Mr. Schumacher was also able to enlarge upon the City Deep scheme, some details of which have already appeared in our columns. Briefly, "The Hill" will afford sites for about one thousand homes. Plots will measure one-third of an acre each and will be sold at an average price of £20 each. The charges in respect of interest on and redemption of loans will be little in excess of those usually paid in

rent for a similar class of dwelling, and will suffice to liquidate the whole of the indebtedness in five or six years, enabling the owner to sit rent-free thereafter. Such restrictions as are imposed with reference to selling and letting are conceived entirely in the interests of the general body of workmen and with the object of preventing speculation and the introduction of undesirable residents. Mr. Schumacher looks on these measures as a sound means of attracting and retaining the services of the best class of workmen to the group's mines on the Central Rand and of creating more settled conditions among the mining population. Special rebates will be granted to employees who remain in the service of the City Deep, in proportion of the size of families. These rebates will be equivalent in all instances to more than the total cost of the site and in some to three times that value, or £60. Mr. Malan, the Minister of Mines, has been so impressed by the merits of the scheme that he has readily given permission for a commencement being made with the building of the first fifty cottages, so it is improbable that the Government will interpose any obstacle with regard to the amendment of the Gold Law which seems essential in order that freehold title can be granted. It is to be hoped that the attitude of the Municipality will be equally sympathetic and that nothing will intervene to retard the early fruition of Mr. Schumacher's scheme of a model village for the Central Rand. Its success is bound to have an excellent influence in forwarding the aims and objects contemplated by Dr. Macaulay and his supporters, when they got the Government to appoint the Small Holdings Commission.

THE SELATI RAILWAY.

THE recent opening of the Selati railway, a work which was long talked of as a prolific source of political intrigue, private jobbery and financial manœuvring of an undesirable kind, has revived interest in a district of which it has frequently been said that only railway communication and proper sanitation were needed to make it one of the most productive gold fields of the Transvaal. More recently the country has been investigated by Mr. A. L. Hall, of the Geological Survey, who in his concluding notes on the result of his work there, points out that as regards the economic position of the district, it is specially suited for small enterprise, either for companies with a modest capital or for energetic individuals. Owing to the very uncertain nature of several of the lenticular and other reefs, the patchy and erratic distribution of pay values, and the inherent geological difficulties of prospecting, there is not much room along the Murchison Range for larger enterprises planned on a more ambitious scale. The unfortunate spectacle of so much abandoned machinery and buried hopes may perhaps act as a warning to future prospectors in the Low Country, which is certainly one requiring an exceptional amount of patient prospecting and developing before machinery can be thought of. The fundamental drawback of no efficient transport, which during so many years has dragged back the wheel of industrial progress, is now permanently and effectively disposed of, and there is little doubt that several previously dormant propositions—probably both the promising as well as the doubtful ones—will share in the industrial revival which may reasonably be expected to follow on the completion of the Selati railway. Incidentally this opening up of the country will have the highly beneficial effect of keeping the local population no longer in comparative isolation under sometimes distinctly unhealthy conditions. It may not be out of place here once more to emphasise the urgent necessity of a comprehensive and permanent water supply for the general purpose of mining development. Though auriferous and other economic deposits have been known for many years in this part of the Low Country, it is surprising how little systematic prospecting has been done, usually, moreover, along old-established routes, and how difficult it seems for economic investigation to get carried further afield from these. More recently mica has received some

attention, but prospecting for corundum and tin is practically unknown, though in both these respects the general outlook is not unfavourable. The opening of the Selati railway and its extension from Gravelotte westwards through the heart of the 'Mist-belt' along the lower slopes of the Drakensberg will undoubtedly prove of far-reaching consequences to local agriculture. It is only necessary to mention the fact that the whole of the remarkably fertile stretch of country round Tzaneen, the entire district of Agatha and Mashutisberg, together with a by no means inconsiderable portion of the Woodbush country, will fall within the beneficial sphere of the new railway to show what an impetus will be given to agricultural development. Permanent and abundant water is everywhere close at hand, the soil is of exceptionally fine quality, and the climate healthy; a good proportion of this highly favoured area, moreover, is Government ground. Mr. Hall adds that "the country, more or less co-extensive with the 'Mist-belt' region, together with its southerly extension along the foot of the Drakensberg, is the finest stretch of agricultural ground which has come under the writer's notice during the course of some nine years' travelling through various parts of the Transvaal Province." The important question of route from Tzaneen now calls for settlement. In regard to this, the report of Mr. B. P. Wall, made in 1909, remains to guide us. In concluding his report, Mr. Wall advised that, when extended, the Selati railway should follow the direction of the traffic immediately offering, the gold reefs of the Murchison Range, copper at Palabora, and the large centres where the needs of natives will develop trade. He thought that it should run due north for 200 miles from Acornhoek, and it should then run up the valley of the Levoeboe along the southern slopes of the Zoutpansberg, passing six miles east of Trichardt, and then joining in at Bandolier Kop. Owing to the country, he held that no extension of the Selati railway would be of much use till it reached the Great Oliphants River, 60 miles, and then the distance to the goldfields would still be 56 miles further. Alternative schemes for affording temporary relief and collecting revenue were investigated and submitted for consideration. The first depended on the decision as to the route between Pietersburg and Bandolier Kop. On the assumption that the circular route would be adopted, there should be a station on farm Niet Recht at the top of Buifles Range, 35 miles from Pietersburg. From this point to Leydsdorp is 78 to 80 miles. A standard gauge railway down the steep descent to the low veld would be a very expensive undertaking, but from observations Mr. Wall considered that a 2 feet gauge railway of the type constructed in Natal to Weenen and Stuartstown, and costing £2,750 per mile (exclusive of rolling stock), to a gradient of 1 in 33, would bring Tzaneen (40 miles) into railway communication with the world for the same money that an extension of the Selati railway would carry the line to Acornhoek. Leydsdorp would then be 38 to 40 miles from the terminus, and the worst or hilly portion of the journey would have been accomplished. The route followed would pass for the last 20 miles through well settled farms, such as Westphalia and Tzaneen, a fillip would be given to cotton growing, and the gold industry of the district would go ahead, while a considerable native population would be tapped for the Witwatersrand mines. Supposing half the claim licences paid in the district in 1903 were renewed in consequence of this light railway, the revenue accruing to Government would be more than 10 per cent. on the outlay suggested. It is clear from various reports that the district is suitable to the operations of the "small man" or of companies with a modest capitalisation. Much has yet to be done, however, before the conditions can be regarded as sufficiently satisfactory even for these. Water, which Mr. Hall says is permanent and abundant everywhere, is not conveniently situated for the purposes of mining along the most important stretch of mining country, the Murchison Range. Water schemes have been mooted and discussed time after time, but unless the Government interest and assistance is secured in this connection the prospect of adequate steps being taken in the matter is not encouraging.

THE GOLDFIELDS REPORT AND MEETING.

An Anticipation of Outstanding Features—A Year's Good Work—The Economics of Native Labour.

THE Consolidated Gold Fields Company in the year ended 30th June secured a net realised profit of £496,013, after deducting debenture interest and all outgoings. In the preceding year the balance of profit was £792,883; in the year ended 30th June, 1910, £493,381, and in the previous twelve months £1,283,891. The continued decline in profit-earning admittedly is large and disappointing. Taking into consideration the prolonged depression in the sharemarket, and the ill-fortune that has pursued the parental company's efforts in the Germiston deep level area, the result secured is, however, probably better than might reasonably have been expected. So far we are in possession only of the cabled summary received from the London office of the company as to operations in the past financial year—that is in the period ended with 30th June last, and the directors' report for the same period. In this latter report the directors express themselves as gratified that the Rand groups, with the exception of one, have discontinued separate organisations for recruiting outside of Portuguese territory, and have formed a corporation in order to safeguard against the growth of competition. It is hoped this will ultimately result in a gradual reduction of the cost of recruiting within the Union, and also that the outstanding group will recognise the importance of joining in the near future. The report points out the efficiency on the company's mines, and says that better results can be recorded in the case of individual companies, yet the profitable operation of mechanical appliances still governs results. The engineers are hopeful that the experience gained and recent improvements will favourably affect the future value of the company's properties. The directors affirm that the year's working justifies continued faith in Rhodesian undertakings. A shortage of labour and high costs of working were experienced in West Africa, but satisfactory profits are expected from the Abbotiakoön mines. In conclusion, the report says that the American business is being carried on on the lines originally contemplated and is progressing satisfactorily.

LABOUR-SAVING DEVICES AND VENTILATION.

To anticipate in some way the statements that will be made by Lord Harris at the meeting to be held in London on Tuesday next, and further to foreshadow a portion of the gist of the superintending engineer's report, we expect that considerable attention will be paid the subjects of labour-saving appliances and underground working conditions. In the last report it was stated that the year had mainly been devoted to further carrying into operation the work of adapting the mines to the position produced by the labour shortage resulting from deportation of the Chinese. It was also declared that further efforts were being made to economise in the use of native labour and to supplement it by the installation of mechanical devices wherever possible. In the main the period reviewed by the latest report largely has been devoted to a furtherance of these phases of Rand mining. In the last twelve months particular attention has been paid to stopping by means of small drills of the hammer type. We understand that at the Knights Deep remarkably good results have been secured from the employment of machines of this kind; results which induced Mr. F. D. P. Chaplin to state at the Simmer and Jack meeting, held some little time ago, that they appeared to be nearer the solution of the problem of mechanical underground stopping than at any previous time. The employment of hammer drills for purposes of underground stopping has been extended to other mines under Gold Fields control, and the endeavours of this group to get a much higher tonnage efficiency from underground labourers by this means are being watched most keenly. The use of detachable drill bits has further quickened interest in the breaking of ore, than which no other aspect of Rand mining offers a larger field for investigation and improvement. Betterment of ventilation underground, too, has bulked largely in the technical schemes of the Consolidated Gold Fields management. Three large fans

have been installed—one in the Simmer Deep, one in the Jupiter, and one in the Robinson Deep—and, in addition, a number of smaller fans have been put in. Furthermore, particular attention has been paid to sprays and bratticing, and as a result the underground conditions have been bettered to a most creditable degree.

NATIVE LABOUR ECONOMICS.

Another point on which Lord Harris will no doubt enthuse is the consolidation of the labour recruiting organisations of the Witwatersrand. The Consolidated Gold Fields Company, possessing as it does some of the lowest grade mines on the Witwatersrand, felt the pinch of the economic shoe in this respect more keenly than other groups owning mines where a larger margin of profit is possible. Despite the poor recovery per ton of the majority of properties controlled by the Consolidated Gold Fields Company, the management have by assiduous efforts to main working costs at a low level been enabled to continue to earn substantial profits.

OUTPUTS AND PROFITS.

Although operations for the ten completed months of the current year do not cover the period dealt with in the Gold Fields Company's annual report, an examination of results obtained by subsidiaries since the commencement of 1912 should prove instructive and in some measure indicate what the outstanding productive feature of the report will be. The results as to revenue and profits secured may be stated in tabular form, as under:

<i>Simmer and Jack.</i>			
	Output. ozs.		Profit. £
Quarter ending March ...	57,574	.....	119,932
Quarter ending June ...	61,727	.....	132,609
Quarter ending September ...	60,230	.....	127,096
Month of October ...	19,413	.....	42,000
<i>Knights Deep.</i>			
	Output. ozs.		Profit. £
Quarter ending April ...	36,296	.....	51,990
Quarter ending July ...	36,413	.....	50,183
Month of August ...	10,349	.....	8,692
Month of September ...	10,679	.....	11,026
Month of October ...	19,300	.....	21,057
<i>Robinson Deep.</i>			
	Output. ozs.		Profit. £
Quarter ending March ...	56,051	.....	107,060
Quarter ending June ...	57,238	.....	105,910
Quarter ending September ...	54,588	.....	96,645
Month of October ...	18,152	.....	31,265
<i>Jupiter.</i>			
	Output. ozs.		Profit. £
Quarter ending March ...	25,449	.....	13,120
Quarter ending June ...	30,104	.....	16,082
Quarter ending September ...	29,966	.....	13,302
Month of October ...	10,929	.....	9,370
<i>Simmer Deep.</i>			
	Output. ozs.		Profit. £
Quarter ending March ...	28,854	.....	7,847
Quarter ending June ...	30,365	.....	8,308
Quarter ending September ...	32,675	.....	11,796
Month of October ...	10,315	.....	1,324
<i>Sub Nigel.</i>			
	Output. ozs.		Profit. £
Quarter ending March ...	5,475	.....	1,151
Quarter ending June ...	5,921	.....	2,866
Quarter ending September ...	6,190	.....	5,191
Month of October ...	2,392	.....	3,050

The Simmer East Company is now absorbed by the Knights Deep and accordingly is not dealt with above.

THE OUTLOOK.

Taken altogether, the present position of Gold Fields mines must be considered thoroughly sound. Although working low grade rock, the mines, as will be gathered from the above, are of large productive and profit-earning capa-

cities. Moreover, they are most efficiently administered and managed, and no material decrease in yield per ton need be anticipated. Evidence of ability to earn substantially larger profits has of late been registered by two or three subsidiaries, and it is probable that still further economies in working expenditure will be effected throughout the group. We expect Lord Harris will corroborate and amplify these anticipations at the forthcoming meeting.

MINE TAXATION IN THE TRANSVAAL.—I.

A Brief Review of Several Legislative Measures—The Problem of Capital Expenditure and Working Cost—Confusion Perpetuated in the 1910 Act.

THE recent case of the Union Government *versus* the Nourse Mines, Ltd., in which the company was sued for certain amounts, said to be due on account of mine profits taxation, once more draws attention to the never-ending struggle between the Revenue Department and the mines as to what part of the annual profit of the latter is taxable and what is not. The sum received yearly from the mines amounts to a very considerable figure, as the following statement, taken from the last annual report of the Mines Department, will show:—

Summary of profits made and tax paid during the financial period 1910-11, ended 31st March, 1911.

Number of mines producing which made a taxable profit	62
Aggregate profits made	£11,385,696
Allowance for amortisation	1,669,946
Taxable net produce	£9,715,750
Amount of tax assessed in respect of those companies which accounted for their liability during the financial period	£971,689 13 3
(Includes interest and penalties)	114 13 2
Amount of tax paid	937,142 15 4
(Includes interest and penalties)	56 15 9
Percentage of tax to aggregate profits made	8.53%
Percentage of tax assessed to dividends declared	9,140,723 0 0
	(10.63%)
Tax assessed per ton of ore milled	11.09d.

The taxing of gold mines in the Transvaal has been in vogue from the earliest days in some shape or another. At the time of the discovery of the Witwatersrand the old Gold Law of 1885 was in force, and under it most of the claims and mynpacht leases were obtained, which to-day are owned by what are called the outcrop companies. By the law of 1885 the Legislature reserved the right to levy a tax of 2½ per cent. on the gross value of finds from mynpachts, so that even in those days the State clearly intended to have a share in the profits of the gold industry. This provision remained in force for many years. Even after a tax of 10s. per morgen was imposed on mynpachts, the Government reserved the right "to claim 2½ per cent. of the gross income during the year, as shown by the books," instead of the payment of 10s. per morgen. In the Transvaal Gold and Base Metals Act of 1903 the right of substitution disappeared and only the old tax per morgen remained. The tax on mynpachts was not enforced until the 17th November, 1898, when the Government passed resolutions, which were confirmed by the Volksraad, levying a tax of 5 per cent. on yearly net profits, except on mynpachts as aforesaid. Then began the necessity of defining what was meant by net profits. The question did not rise to the rank of a problem in those days, because a wise and far-seeing Legislature enacted that under cost of production should be included all reasonable amounts for writing off "according to the judgment of the Government." The Chamber of Mines sent deputations to the Government to discuss the subject, and it was finally agreed that the redemption of capital expended on buildings, equipment and development would be allowed by annual writings off proportionate to the life of the mine.

THE MILNER PROCLAMATION.

Affairs remained in this condition until the 5th June, 1902, when a proclamation was issued by the Administrator, Lord Milner, repealing the regulations published by the Government of the late South African Republic regarding the payment of the 5 per cent. tax on the net profits of gold mines and levying a tax of 10 per cent. in lieu thereof. A deputation from the Chamber of Mines was, of course, promptly decided on, and at an interview with the Administrator and members of the Executive Council, which was held on the 16th June, the Chamber's deputation put before His Excellency and the members of the Council their views with regard to the operation of the tax, and expressed their opinion that great practical difficulties would be experienced in carrying out the provisions connected with it. With regard to the provisions of the Act, His Excellency claimed to have long and special experience of the subject. All new measures of this nature appeared, he said, to the public to be difficult and expensive in working, but in practice work easily. This particular measure was simpler than most. On the side of the Government the officials would endeavour to make the law work cleanly and without friction, and, if taxpayers acted in the same spirit, there should be no difficulty at all. The principle of the tax was for the time being inevitable.

The tax, according to the proclamation, was to be levied on "the annual net produce obtained from the working of claims, mynpachts and other gold-bearing properties situated in this Colony: such net produce shall be taken to be the value of the gold produced after deduction therefrom of the cost of production and of such sums as may be allowed in respect of the exhaustion of capital as hereinafter defined."

For the purposes of the proclamation the cost of production was taken to mean:—

- (1). All amounts not being capital outlay actually expended during the year on winning and treating the ore under the heads specified in an accompanying schedule.
 - (2). All amounts actually expended on general charges as specified in the aforesaid schedule.
- Capital, for the purposes of the proclamation, meant:—
- (1). All amounts actually expended in mine equipment, shaft sinking and development, whether incurred before or after the commencement of production, not being of a recurring character or such as are ordinarily defrayed out of revenue.
 - (2). All amounts expended for ordinary purposes of administration prior to the commencement of production.

The amount to be deducted from the annual net produce by way of allowance for exhaustion of capital was defined as such sum as, if paid by way of annuity from the date of commencement of production (or from the date of the expenditure of capital, if such expenditure took place subsequent to such commencement) for the whole period during which the property was estimated to continue to be workable, would, at 3 per cent. compound interest, produce an amount equal to the amount of such capital. For instance, if the capital expenditure to be amortised amounted to £500,000, and the life of the mine from the date of the commencement of production was 10 years, the annual sum to be deducted from the value of the gold produced, less working costs, would be £13,630. This is the yearly sum that,

at 3 per cent. compound interest, would amount in 10 years to £500,000. Among the heads specified in the schedule as being operations on which amounts, not being capital outlay actually expended, might be put to the cost of production, were development and shaft sinking. It is interesting to observe, therefore, that work under these headings was admittedly, by implication, capable of being segregated under the terms of capital expenditure and working cost.

In 1910 the Mining Taxation Act was passed by the Union Government. It cancelled previous measures relating thereto, and came into force on the 31st December,

1910. The only difference worth noting at the moment between this and the previous Act is that connected with capital expenditure. "Capital expenditure," says the Act of 1910, "shall mean expenditure on shaft sinking, equipment, development prior to the commencement of production and excess development thereafter, and on general administration and management prior to the commencement of production." While this definition is somewhat narrower than the earlier one, it is not by any means clearer—rather the reverse, in fact, since it introduces the indeterminate element of excess development.

NEW MODDERFONTEIN.

A Plan of the Workings—A Graphic Representation of the Company's Long Life.

We here reproduce a plan of the workings of the New Modderfontein Gold Mining Company as at the end of June last, which accompanies the report of the proceedings at the fifteenth ordinary general meeting of shareholders held last week. In our last issue we dealt at some length with Mr. Schumacher's speech and with the reports of the consulting

"New Modders." The relative situations of the new circular shafts and the No. 12 incline and the extent of the area to be exploited from these two highly important points of attack, subjects which called for lengthy discussion in Mr. Schumacher's review, are here clearly shown, as are the main haulage level and the nature of the western workings.



engineer, Mr. B. Madew, and the manager, Mr. E. Miles Sharp. The speech of the Chairman, comprehensive and lucid as it was, does not bring home to one the immensity of the mining area still lying untouched so clearly as does the diagram reproduced above. From this, one is enabled in some measure to gauge the tremendous potential value of

It may be noted that from east to west the property is in extent 2.2 miles, whilst from sub-outcrop to the southern boundary adjoining the Modderfontein Deep Levels Company is 1.6 miles. The hatched portions of the plan show ground stopped out, and a mere glance suffices to indicate the long life which the company will enjoy.

THE WANE OF PROSPECTING IN THE TRANSVAAL.

Some Thought-Compelling Government Figures—The Exodus of the True Prospector—The Penalty for Past Folly—Returns for Districts.

A RETURN recently issued by the Union Department of Mines indicates a further substantial restriction of prospecting in the Transvaal. At the end of last year there were 925 prospecting permits in force in the Province. At the end of June last this number had declined to 814, and during the succeeding three months was further reduced to 690. Similarly the number of claims held under prospecting title exhibit a decline from 89,577 at December 31st, 1911, to 79,796 at June 30th, 1912, and 77,754 at September 30th last. From the fact that prospecting permits exhibit such a large decline it may be inferred that the returns of prospecting claims held at the end of this year will exhibit a further contraction. The months of July, August, September and October are the best times of the year for prospecting in South, as well as South-Central Africa. The grass is then withered or burned down, and the absence of rains, combined with comparative freedom from malaria, render these the most favourable months for mineral exploration.

RETURNS BY DISTRICTS.

The Government statistics do not, however, manifest any increased activity in prospecting; in fact the reverse is evidenced. A closer examination of the permit statistics shows that since the end of last year there have been declines in practically every district of the Transvaal. In the Johannesburg area there has been a decline of 60, in the Krugersdorp district a decrease of 3, and in the Boksburg fields a drop of 2. Apart from the Rand proper, a decline in the Klerksdorp district from 78 to 36 is noticeable. In the Barberton fields the permits in force at the end of September last were 172, as compared with 249 at the end of last year. In the Pilgrim's Rest district there was a drop from 138 to 119, and in the Pietersburg district a decline from 242 to 175. Three districts only show any increase. There were 12 more permits in force in respect of the Heidelberg district, 12 more in the Ottoshoop area, and 1 more in the Pretoria field. In every mining district of the country, with the exception of Ottoshoop and Pietersburg, fewer prospecting claims were held at the end of September than at the end of last year, and the totals for the whole Province are: At September 30th, 77,754; June 30th, 79,796; December 31st, 1911, 89,577. Diggers' claims show an advance from 10,005 to 10,666, fairly large increases being recorded in respect of each section of the Witwatersrand. The base metal claims at the end of last year numbered 65,644, and at the 30th September, 59,885. The most noticeable decline is in the Pietersburg district, from 57,244 to 50,505, and the only increase is in the Barberton locality, from 7,274 to 8,353. To sum up the position there were, at the end of last year, 165,226 "total claims" held in the Transvaal, and at 30th September of this year 148,305.

FEW RECENT DISCOVERIES OF IMPORTANCE.

These figures afford considerable food for reflection. They seem to indicate that prospecting activity is on the wane in the Transvaal. Yet this may be only a temporary phase. The Transvaal has proved itself to be a wonderfully mineralised country, and from time to time reports of discoveries of various minerals—both metalliferous and non-metalliferous—come to hand. It can, however, be stated, without hesitation, that of recent years the mineral discoveries of the country have been most disappointing. If we except the excellent results lately obtained on the Further East Rand, and the opening up of the Breyten coalfields (developments which are rather outside the pale of ordinary prospecting operations), is may truly be said that since the discovery of Zuaipplaats and other tin mines in the Waterberg district, no new mineral deposits of any real or lasting importance have been located. There has been a succession of discoveries, which, at times, have given great promise of becoming really

important propositions. But their brilliance and promise have been essentially temporary. To recount a few of the more recent disappointments, the Cyferfontein fiasco, the short-lived prosperity of the Mooifontein and London Diamond Diggings, and more recently failure of certain diamond prospects in the Pretoria district may be mentioned. The Waterberg Tin Fields, too, are now viewed in a more moderate light, and the application of reasoned judgment to their prospects has disillusioned the public.

PAYING THE PENALTY.

To go further back into the years and revive the memories of such defunct and vastly over-rated concerns as the Coronation Syndicate and the Bushveld Tin Mines, is to resuscitate many sorry memories. What the public of South Africa squandered in such enterprises is well-nigh incalculable, and incalculable, too, is the damage done by such burlesques of industry to legitimate prospecting ventures. No matter how genuine and good the prospect, it has for years been a matter of the greatest difficulty to raise capital for the exploitation of any Transvaal mining enterprise unless it be an East Rand deep level, or a coal mine in which the essential makings of a colliery are within sight and capable of some methods of measurement. The period of comparative inactivity that recent years have brought has, we fully believe, witnessed the exodus of the majority of the true prospector type to pastures new, to mining fields not suffering so acutely from the disabuses of company and syndicate promotion as the Transvaal, and to countries where the Mining Laws are more favourable and the concessions of private companies more generous to the individual prospector. There may never again be observed such a wave of prospecting activity as spread over the Transvaal a few years ago. But we are sure that more intelligent prospecting and more commendable methods of flotation could bring about a revival of "Outside Districts" mineral activity in this country, granted more sympathetic action on the part of the Government and the offering of less niggardly rewards for the discovery of payable mines by the large land owning companies.

Rietfontein Proclaimed.

This week's Union "Gazette" contains notification of the intention to throw open the farm Rietfontein No. 11, Boksburg district, as a public digging from and after 2nd December. The farm is registered in the name of the Apex Mines, Ltd.

Diamonds in Canada.

Mr. Alfred Lee, a member of the Ottawa expedition just returned from Ungava, says that the stories of the existence of diamonds in that country are true, and that he has made important discoveries. It is understood, according to *The Times* correspondent at Ottawa, that members of the expedition will go north again, and that other expeditions are on their way to Ungava.

Labour Position.

The following labour figures for October are compiled and furnished by the Chamber of Mines: Number of natives employed at the end of last month by members of the Witwatersrand Native Labour Association and contractors: On gold mines, 182,058; on coal mines, 8,803; on diamond mines, 15,496; total, 206,357.

VILLAGE DEEP PROGRESS.

Scheme of Underground Concentration Almost Completed—Incline Shaft Approaching the 20th Level—New Winders at the Turf Shaft.

About the end of this year the scheme of underground concentration at the Village Deep, for which preparations have for some considerable time been proceeding, will come into effect. The event will be of great importance to the Village Deep Company, as it will enable the management to cease operating some of the older portions of the equipment and concentrate work in the Turf Mines or deeper section of the property, which will, of course, be attended by substantial economies.

THE CONCENTRATION SCHEME.

The scheme involves concentration of underground transport of ore around and hoisting ore from the "Turf" or deep vertical shaft. The 16th level has been driven as a main haulage and collecting level. The haulage now is completed, and in a few weeks' time a large proportion of ore broken in the upper section of the mine will be allowed to gravitate down into the Turf section and thence will be hoisted to surface. In connection with the Turf shaft, it is important to learn that the large Whiting rock hoist and the man hoist, both electrically operated and models of the latest practice in engineering, have just been completed, and are operating very satisfactorily. No trouble has been experienced at the Village Deep with the tail rope of the Whiting hoist, as has, we believe, been met with at one or two other properties.

HIGH DIP MAINTAINED.

The incline shaft is being carried down with all despatch. It is now below the 19th level, and is fast approaching the 20th. The present vertical depth is about 4,250 feet, and it is highly important to note the dip of the reef is still over 40 degrees. The shaft is, in fact, being sunk at an inclination of 41 degrees. We have in previous issues re-

ferred to the importance of this abnormally high angle of dip at such a depth, which of course means lower shoveling charges and a greater tonnage per claim.

DEVELOPMENT.

Working costs last month were at the rate of 20s. 5d. per ton, but it should be realised that this includes 3s. 6d. on account of development. A large footage has been driven, sunk and risen in the mine during the current year, and the next annual report will at least show a maintenance of ore reserves. In the second quarter of the year 149,700 tons were milled and 163,881 tons of payable ore of an average value of 28s. 7d. per ton were fully blocked out and valued and added to the reserves. In the first quarter 1,915 feet were driven and reef disclosures were as under:—

	Distance exposed. Feet.	Width. Inches.	Assay Value.
Main Reef Leader ...	1,252	31.0	58s. 7d.
South Reef	1,425	21.0	58s. 1d.

The proportionately small footage of the reef disclosures was due to the continuance of the policy of driving in the footwall of the reefs. A large proportion of the footage on reef consisted of box-holing, enabling a valuation to be made of a relatively large tonnage. The values disclosed by the quarter's development compare favourably with those of the previous year. The good values being secured over considerable sections of South Reef are particularly satisfactory. Altogether the Village Deep property appears to be looking very well at the time of writing, and with the scheme of underground concentration of work practically completed, the outlook for larger profits in the near future undoubtedly is a good one.



ALLUVIAL WORKING IN THE BARBERTON DISTRICT: SOME VIEWS OF RECENT OPERATIONS.

THE MINERAL POSSIBILITIES OF THE MURCHISON RANGE.

A Miniature Rhodesia in the Transvaal—Coming Flotations—A Field for Capital and Enterprise—Proximity of Coal.

THE opening of the first portion of the Selati railway was effected last week. The news is of obvious importance in connection with the opening up of the neglected Murchison gold fields, which, according to Mr. A. R. Sawyer, Dr. Merensky and the late Dr. Dorffel, possess possibilities equal at least to those of the Rhodesian gold-bearing districts. The Antimony Reef, after all, presents the same metallurgical problem as has been so successfully solved at the Globe and Phoenix, where the present of antimony long impeded the extraction of the gold. On several of the mines of the Murchison good, if quiet, work has lately been done, notably on the La France, and the Lawrence Block, and the advent of the promised railway will give the whole district a great fillip. Not only does the promise of cheaper transport hold out favourable prospects for the whole antimony line, but the greatly reduced working costs, rendered possible by the use of suction gas plants, will have a stimulating effect on enterprise. In this connection, we learn that a valuable seam of coal, 40 feet thick, has been proved to extend over a considerable area in the neighbourhood. The coal is said to be equal to any in the country, and its proximity to the Murchison gold fields naturally means much to the latter in the way of cheap working. Within the territory to be served by the projected railway the mineral discoveries of potential value comprise deposits of gold, copper, antimony and mica. The geological formation throughout this area is one that is well known as containing promise of the presence of many other minerals besides those mentioned, and a large part of the district is still practically unknown territory.

In a recent report the Government Mining Engineer pointed out that the Murchison Range has been an important prospecting field in the past, and numerous syndicates and companies have at one time or another carried on operations on its reefs. There are two main lines of reefs, known respectively as the Northern or Antimony Belt, and the Southern or Spitzkop Belt. Both of these lines extend for many miles, not as continuous reefs, but as well-defined belts in which reefs of greater or less width and longitudinal extent are found. The better known properties in the Murchison Range are the H.E. Proprietary, which is interested in the Blue Jacket and Free State mines, the Gravelotte Mine, and the Sutherland Reefs Company. The H.E. Proprietary Company is connected with many low country ventures, and its holdings are typical of the mining propositions found in it. On both the Blue Jacket and the Free State Mines rich chutes of ore have from time to time been struck, but the average value of any considerable bodies of ore are considered too low to justify further expenditure at present. These rich chutes would, however, be large enough to keep tributors or small syndicates at work. The company reports that it has spent £60,000 in the district, and is at present employing seven diggers. It recently erected a small steam stamp mill, and won £2,700 worth of gold in a few months from the Blue Jacket mine, but after thus testing the property it finds the conditions of working too onerous to continue. The company now owns 357 claims as against some 3,000 formerly held by it. The Gravelotte mine of 113 claims, now owned by the Consolidated Mines Selection Company, has been opened up to a depth of 220 feet, and is patchy. The antimony reef on this property contains both stibnite and gold of very irregular values, not very promising at depth. The property as a whole offers certain inducements for working if transport and working costs could be materially reduced. The Sutherland Reefs Proprietary Company owns 800 acres on the farm Potsdam, near Leydsdorp. The company claims that it has a reef of 5 feet developed, averaging 9 dwts., but the Inspector of Mines cannot confirm this. He is, however, of opinion that the property could be worked successfully on a small scale with cheaper transport. Besides these propositions there are a number of other blocks and properties along the two mineralised

belts of the Murchison, such as the Caledonian, Lawrence, Pioneer, Coblenz, Rainbow, etc. The formation and the reefs are very similar to those found in Rhodesia, and the advent of cheap transport is likely to induce active prospecting operations being resumed, and possibly to lead to the establishment of small plants wherever payable chutes are found.

Antimony is found in the Murchison Range, along with gold, in the so-called antimony line of reefs. The best deposit is found on the Gravelotte mine, where the metal is found in abundance in the upper oxidised portion of the lode, but decreases in quantity when the pyritic zone is reached. Little attention has hitherto been paid to the commercial aspect of this occurrence, probably owing to the low prices prevalent in former years, and to the fact that the oxide, which is principally found near the surface, escaped notice.

The principal drawback to the development of the district has been the lack of cheap and quick transport for men and supplies, and this was accentuated when the outbreak of tick fever amongst cattle took place. The mineral indications are plentiful, but even claims of considerable promise have been allowed to lapse owing to the fact that money could not be found for prospecting, as the district was considered more or less out of the pale by reason of its isolation and prohibitive cost of transport. The bad climate has also militated against the opening up of the district. Railway facilities indirectly improve the climatic conditions by allowing improved methods of working, the better housing of employees, cheaper luxuries and comforts, and, above all, the feeling that a man can easily get away for a change when necessary. As regards malaria, good feeding and housing are recognised as being very large factors in warding off the disease. With such improved conditions a better class worker will be introduced instead of the unsatisfactory class of man with which the low country has hitherto had to put up. To the better class man the risk of fever may not be a very formidable barrier, but he cannot long endure the sense of isolation and lack of stimulus attaching to a district cut off from the larger centres of population. The Geological Survey Department refers in the following terms to this district in its report for 1906:—"There is no doubt that these fields could support a fair number of independent workers or small groups of miners were it not that under present conditions transport rates are practically prohibitive. . . . Although the country offers so many opportunities for small ventures, it is not without promise for enterprise on a more extensive scale. Ore deposits of the kind described in connection with the pyritic reef of the Free State mine, and possibly also those of the type of the Coblenz Reef, give promise of mining operations of considerable magnitude once the difficulties of transport are overcome. The district forcibly impresses the visitor as much by its possibilities as a highly mineralised area as by the very small amount of work which has hitherto been expended upon it, and which has been almost entirely limited to a few comparatively restricted areas." In order to improve the water supply—which is rather poor along the Murchison Range—it is contemplated to put down a series of 13 boreholes at a total cost of £3,400. There can be no question that the extension of the railway will put new life into the various prospecting and mining ventures, and open up a large expanse of highly mineralised country that offers great scope to enterprise and capital.

Fraser and Chalmers.

The report of Messrs. Fraser and Chalmers, Ltd., shows a net profit for the year ended the 30th of June of £7,378. Apart from an interim dividend of 3 per cent., no further dividend is recommended.

RAND WORKING COSTS AND STAMP CAPACITY.

A Comparative Review of Rand Conditions—The Relative Position of Stamp Capacity and Cost of Production—Metallurgical Efficiency in the Germiston District.

THE accompanying diagram is intended to show the comparative condition of the working costs of the mines of the Rand for the month of August last, and also the relation between stamp capacity and working costs. The figures of the month of August have been chosen because in a previous diagram relating to average recovery the Chamber of Mines analysis figures for the same month were made use of, and a comparison between the present diagram and the former, which appeared in our issue of the 26th October, will doubtless suggest some interesting lines of thought. The average working cost during August for the fifty-four producing mines of the Witwatersrand, including the New Rietfontein mine, which, as being on an outside series of reefs, is not dealt with in this discussion, was 18s. 10d. per ton milled. It is noteworthy that the Crown Mines working cost for the same period was exactly the same amount. It

exactly equal to this sum, the actual amount being 11s. 2d. per ton. The group of mines between the Simmer and Jack and the Witwatersrand, both included, as was pointed out in a previous article, have a markedly low average recovery. The accompanying diagram makes it evident, also, that they have, taken altogether, the lowest average working costs. The margin between recovery and cost is so small, however, that profits, also, are upon a low scale, all with one exception, that of the Rose Deep, being below the Rand average of 10s. for the month in question; and several being less than half that amount, the Simmer Deep showing a profit of only 10d. per ton milled. The distinction of having the highest working costs on the Rand, it will be seen, is shared by the West Rand Central, Princess Estate, Bantjes, Jumpers, Geldenhuis Deep and Cinderella Deep. The West Rand Central and Jumpers being small ventures, are hardly

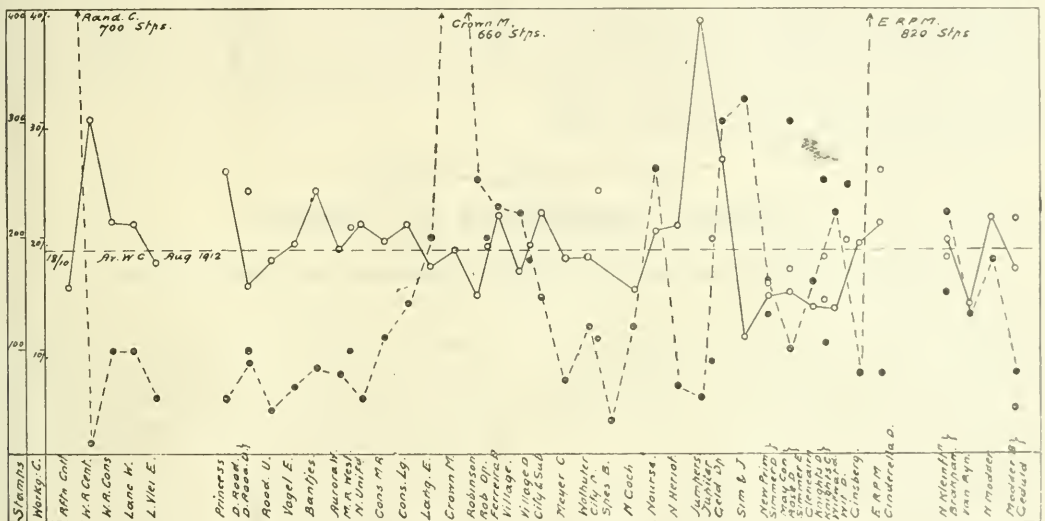


DIAGRAM SHOWING RELATION BETWEEN WORKING COSTS AND STAMP CAPACITY ON THE RAND—AUGUST, 1912.

may be remarked, *en passant*, that a still more curious instance is afforded by the Ginsberg, of which, during August, the average recovery was 28s. 9d., and the average profit 10s. per ton milled, each amount being the average, also, for the whole of the Witwatersrand. The working costs of the Ginsberg were, however, 19s. 5d., the apparent discrepancy being due to minor variations in the methods adopted by different companies in their monthly declarations.

EAST AND WEST.

West of the Crown Mines, it would appear from our diagram, working costs are generally higher than on the eastern side as far as the East Rand Proprietary Mines, although the tendency towards a fall in the latter direction is somewhat nullified by the high charges at the Jumpers and the Geldenhuis Deep. The working cost at the Jumpers are, in fact, abnormally high owing to the circumstance that resueing, an expensive method of stoping when calculated on the ton milled, is in vogue there. The Geldenhuis Deep costs are due to special difficulties which have prevailed at the mine for some time past. The lowest working costs on the Witwatersrand, as is apparent from our diagram, are those of the Simmer and Jack, which, for the month of August last were 11s. 3d. per ton milled. Another of those strange coincidences which reveal themselves when the figures of the Chamber of Mines analysis are plotted in this form is that the estimated working profit of the mine was almost

to be considered in this connection, and the high cost level of the latter has already been explained as due to the particular method of working adopted. It may be added that as an off-set to this the Jumpers recovery, at 43s. 8d. for August, was the third highest on the Rand.

STAMP CAPACITY AND WORKING COSTS.

When one comes to consider the apparent effect of stamping capacity upon working costs, it is evident that the relationship is only occasionally somewhat obvious. For example, the costs at the series of mines west of the Langlaagte Estate, as far as the Durban Roodepoort, do not compare unfavourably with those of the mines eastward of that point, as far, say, as the City and Suburban, although the advantage is with the latter as far as crushing capacity is concerned, and also, it may be added, as far as reef thickness is taken into account. Further east than the City and Suburban, as far as the New Goch, a diminution of stamp equipment is roughly coincident with a decrease in working costs, while with rising stamp capacity the Nourse Mines shows a higher level of working costs. Thenceforward to the Ginsberg some appearance of a mutual relationship is evident, but the East Rand Proprietary Mines, with the greatest crushing equipment in use on the Rand, shows a working cost per ton milled which is well above the average as compared with the other mines in the diagram. The want

of consistency in this respect is admirably demonstrated by the small group of mines in the far East Rand, where the progress of equipment and cost of working seems to run on approximately similar paths. A great deal of allowance, of course, has to be made for the different scale employed to mark the variations in crushing capacity and working cost respectively, but even this allowance, although it may affect detailed comparison between one mine and another, does not materially influence the broad conclusions come to in the preceding remarks. The explanation of this want of correspondence between the magnitude of the output of various mines and the cost of production is, naturally, the want of uniformity in other conditions, namely, of thickness and character of reef, existence or non-existence of broken country, and other matters. Before concluding reference may not inappropriately be made to the low working costs of the group of mines under the control of the Consolidated Gold Fields in the neighbourhood of Germiston, where a notably low level of working costs prevails. The truth of the saying that "necessity is the mother of invention" is abundantly exemplified in the history of these companies whose low average grade has demanded special efforts in the way of working methods and appliances in order to achieve satisfactory profits. It may be said that with the wide reefs of that district these efforts have not been called forth in any uncommon degree. An examination of the detailed charges which go to make up the aggregate working cost, however, show conclusively that rigid economy has not prevailed underground only. Acting on the principle that with a large output even the smallest increment of gain is something to be considered, the metallurgical

side of gold winning has been improved upon and facilitated in every possible direction. It is not alone by adding to or modifying existing plants that economies are to be effected. Occasionally the scrapping of plant in a wholesale way, with the object of ensuring the increased profits that can be obtained by a plant which is up-to-date in every respect, is a process which recommends itself, and it is in this direction that the Consolidated Gold Fields has shown itself distinctly in the van of progress on the Rand. The financial outlay and risk has been something to be thought of, but the results have abundantly justified the policy which has usually been followed by the corporation in matters of this kind, and Gold Fields metallurgy, from the financial side no less than from the technical standpoint, is, as may be seen in the annual reports, a distinct success.

THE FUTURE.

How far the condition of working costs, as exemplified in our diagram, is likely to be re-shaped during the next few years it is difficult to say. Individual changes there will undoubtedly be, but whether the general effect will be materially altered, least of all improved, is open to question. A greater production and possible improvement in yield in special instances may suffice at least to keep up the aggregate yearly profit of the Rand, and if this much be accomplished a great deal will have been done. The expansion of mining in the far East Rand will later on be an important factor in maintaining the output of the banket area, and it is not unlikely that its vigour may more than make up for declining power in the older ventures of the Main Reef series.

COPPER PROSPECTS IN AFRICA.

How the High Quotations for the Metal Stimulate Our Copper Output.

Tin and copper continue to be quoted at high prices in the metals list, and, so far as can be judged, the quotations are at least likely to be maintained for a considerable period. The influence of the position with regard to the first-named metal on South African industry is now pretty thoroughly realised, but that South and South Central Africa have come to possess a stake—and an important stake—in the world's copper market is not perhaps generally appreciated. In the Cape Province Namaqualand continues to yield the whole of the production, but there are no real reasons for anticipating that there will be any appreciable expansion of copper producing activity in this field. In the Transvaal and in Rhodesia the position is different. The pushing of the Selati and Pietersburg railways into the heart of the Zoutpansberg foreshadows considerable mineral development there in the near future. Preparations are being made either to reopen mines or to extend operations at mines already working, and in the programme of resuscitation and extended development copper is certain to find an important place. The Messina mine is being prepared for a production of 15,000 tons of ore per month, and the extended development of the other cupriferous areas lying to the south of the Limpopo River is practically certain to be undertaken with the growth of the industry in the extreme Northern Trans-

vaal. Both in Southern and Northern Rhodesia active development of copper propositions is proceeding, and within the next year or two there should be a revival of production. The Falcon mine is being equipped on a basis of 15,000 tons per month capacity, and considerable quantities of copper, in addition to gold, should be turned out by this proposition. The Bwana M'Kubwa, on the Congo-Northern Rhodesian frontier, also is being brought to a productive stage, and a treatment installation is in course of erection. Furthermore, the Umkondo mine, in the vicinity of the Sabi River in Southern Rhodesia, and the Penhalonga on the Mashonaland-Portuguese East African frontier are being reopened, and a certain amount of metal is being produced by the Kafue mines and the Kansanshi property. Clearly, then, Southern and South Central Africa will benefit through the strong demand for copper and the fact that few new producers of importance appear on the industrial horizon. Africa, south of the equator, is in fact likely to become one of the first twelve copper producing countries of the world during the next few years on the outputs of Transvaal, Rhodesian and Cape Province mines. And this quite apart from the Katanga belt, which is of course a vast potential producer, and where, by the way, the metallurgical scheme is being reorganised under expert superintendence.

Piggs Peak.

The following is the result of operations for October at Pigg's Peak Development Company's mine: 25 stamps and 1 tube mill ran 22.6 days, crushing 1,987 tons; yielding 447 ozs. fine gold, cyanided 2,001 tons, yielding 298 ozs. fine gold; concentrates shipped 4½ tons, containing 135 ozs. fine gold. Total recovery 880 ozs. fine gold of an estimated value of £3,721. Working costs £1,967; estimated profit, £1,754. Operations have been considerably hampered by the abnormal drought.

Electric Machinery in Fire-Damp Mines.

In a paper read before the recently concluded Congress of Austrian Mining Engineers, Mr. Lisse, M.E., of Berlin, has devoted special attention to contrivances lately adopted by some coal-mining concerns for placing switches, fuses, resistances and transformers installed underground in positions liable to fire-damp, in an oil-bath which, besides its generally cooling effect, tends to extinguish sparks generated by switches and fuses. The favourable results obtained by these contrivances have quite recently led to arrangements in up-to-date mines whereby all wire lines, bus-bars, and separating switches are also placed under oil, so that all voltage carrying metal parts and their insulators are withdrawn from the influence of air and humidity as well as from contact.

SOME SHORTCOMINGS OF PRESENT DAY RAND MINING METHODS.

Are Pillars Adequate?—"Air-Blasts" and the Future—Development Practice Too Costly?—Some Thought-Compelling Considerations.

Now that the Rand can claim the distinction, amongst others, of possessing the deepest gold mine in the world, it would seem an opportune time for reflection amongst our mining engineers and mine managers, more particularly with regard to the lessons learnt during the period of this notable achievement. In the majority of instances it will probably be admitted that after all the attainment of a depth of five thousand feet from the surface has not resulted in a marked change in the methods of mining such as would have probably been the case in any other mining field of the world. To those engineers who have had much experience of deep mining in other parts of the world, this condition of affairs would appear almost incredible. Few engineers would be prepared to see the same method of working adopted at growing depths as prevailed at the outcrop, but as a matter of fact such is generally the case, for the modifications made in the system of mining have been few and on the whole totally inadequate to meet the altered conditions.

It may be explained that the inability to recognise these changed conditions has in a variety of ways led to considerable trouble and loss on some of the mines which would have been probably much enhanced had not the fundamental conditions of mining on the Rand been specially conducive to deep mining. It has happened that deep vertical shafts have been sunk with little protection provided against the risk of moving ground, with the result that enormous sums have been spent in sand-filling to prevent the total loss of the mine. One would naturally suppose that when a depth of 2,000 feet is reached it would need a larger shaft pillar to keep everything steady than what was deemed necessary for the protection of a shallow shaft and when working close to the surface, but it is to be feared that in a good few instances this simple precaution has been quite overlooked. At a depth of 3,000 feet even greater shaft pillars would naturally be expected to be necessary, and it is clear that as great depths are attained this question of shaft pillars is bound to be a most important one. There are indeed some mining engineers prepared to advocate the abolition of shaft pillars altogether when great depths are attained, and extract the whole of the reef, even near the shaft, on the ground that at such depths shaft pillars may do more harm than good, whilst their existence represents a considerable amount of ore unnecessarily kept from the mill. Nevertheless, whilst several mining engineers have expressed this opinion against the retention in depth of huge shaft pillars, not a single instance is known where an engineer has been bold enough to attempt to open a deep mine without attempting to leave an adequate shaft pillar.

It is naturally impossible to quote a fixed rule with regard to the size of shaft pillars because so much depends upon strata and the surrounding circumstances of each particular mine. Naturally on the Rand, where the mining country is so excellent and strong, much smaller shaft pillars are necessary than in other mining fields, where the conditions are so different. It cannot even be said that the size of a shaft pillar can be absolutely governed by the depth which to most engineers would seem a fairly safe indication to work upon. The writer has known a mine where at a depth of 1,200 feet from the surface the leaving of a circular pillar with a radius equivalent to one-third the depth of the shaft answered perfectly well, whilst in a similar instance where the depth was over 3,000 feet a pillar with a radius equivalent to the full depth of the shaft proved totally inadequate, due largely to the fact that the area occupied by the shaft and its pillar in the latter instance was considerably

faulted. It may be noticed that some of the largest mines on the Rand have recognised the necessity of leaving substantial shaft pillars and have taken credit for the ore disclosed in driving through the pillar as developed resources of the mine, the working of which will probably only take place when the mine is abandoned.

If the necessity of leaving gradually increasing shaft pillars in depth is already recognised on the Rand, one is disposed to ask why in the underground workings larger pillars should not be left as the depths increase than was the case near the outcrop. Undoubtedly in some instances larger pillars are so left, but it is far from being a universal practice, and it is clear that if this practice be liberally observed there must come a time when most of the reef in the first working will be left in the shape of pillars. Mining operations would then reach a state at which the cost of developing a mine on the ordinary lines would become prohibitive, in fact it is much to be feared that in some of the Rand mines the present methods of development and subsequent working are much too expensive.

The fact must have struck many of our readers that the cheapest worked mines on the Rand are those where comparatively little is being spent on development. There is thus an inducement to the engineer to reduce his development outlay to the lowest limit, and here lies the danger that unless the engineer is essentially a practical miner he will drive his development drives so far apart as to materially increase the cost of subsequent working in his laudable desire to cut down the cost of preliminary development. A practical mining engineer will not, as is often the case, lose sight of the fact that the method of development must bear some relation to the method of working intended to be afterwards adopted in working the reef and the method of working must be governed by questions of depth and economy as much as by any other consideration. Before deciding on the method of development, the engineer must first consider the most suitable and economical system of working likely to be adopted, and in this consideration the question of depth, as previously mentioned, along with surrounding conditions, must enter largely. Any neglect of such important consideration might lead to serious consequences and loss by the occurrence of "air-blasts," to which in growing depths the strong country rock of the Witwatersrand is particularly liable.

If mining operations on the Rand are to be conducted with an ample margin of safety from air-blasts, even under ordinary circumstances, it is necessary that a third of the area should be occupied by pillars in the first working even at such a shallow depth as 2,000 feet from the surface. At a depth of 3,000 feet it might be advisable to leave one-half in pillars, and, if the same reasoning be continued, it will be urged that at a vertical depth of 6,000 feet the leaving of pillars would be useless, and if mining is to be carried on at that depth with safety a different method of mining will become necessary from any yet practised on the Rand, that is if air-blasts, with all their attendant evils, are to be avoided.

It may seem somewhat extravagant to talk about methods of working at a depth of 6,000 feet, but it must not be forgotten that already a depth of over 5,000 feet has been attained, and even at much shallower depths air-blasts have made their appearance. Depths are now being reached on the Rand in stoping operations when not only the size but also the shape and proportions of the pillars must be taken into more consideration. It will not require much reflection to show that the old methods of mining in the outcrop mines will have to be considerably modified to suit the altered conditions of the very deep mines, and where for reasons of safety only one-half the reef can be extracted at first working, the pillars will have to be left in such a

shape and position as to admit of prompt and subsequent total extraction. Neglect of these ordinary precautions has led to serious loss and inconvenience through the occurrence of air-blasts, notwithstanding the fact that adequate warning was given about three years ago. There has been too great a tendency for mining engineers on the Rand to regard the local hanging and footwalls as composed of too hard and compact a substance to move, even if the whole of the reef be extracted. Repeated warnings have been given that such is by no means the case, and already those who have disregarded the warning have atoned for their neglect. As mining operations increase in depth the tendency for these air-blasts to occur must increase, and they will only be reduced to a minimum by the adoption of better and more suitable mining methods.

In the question of mining methods of the future, that of economy must not be overlooked. It has been already pointed out that the ultra cheap working costs are principally obtained where little or nothing is charged for development, and as the mines increase in depth development charges must perforce be reduced. To-day the development costs range from sixpence to four shillings per ton milled, and it is difficult to imagine a deep level mine working at less cost than 16s. per ton milled, including development charges, but it will be gathered from what has been stated that as depths increase development costs may be reduced and may be as in coal mining, whether the reefs flatten or otherwise may entirely disappear. This is why mining engineers accustomed to coal mining methods show a tendency to attach less importance to development than those engineers exclusively brought up to metalliferous mining methods. This undoubtedly opens up for discussion a most important and serious question. Still on the Rand in the past far too much has been spent on development, and, with the less yield of gold in depth showing itself in some instances in the deep level mines on the Rand, it is becoming necessary to observe the strictest economy in working and to adapt mining methods to the altered conditions even if such methods may seem revolutionary.

G.E.A. Syndicate, Limited.

The following condensed report by Mr. H. Loret, engineer to the German East Africa Syndicate, Limited, has been forwarded us for publication:—

In connection with my visit to German East Africa, on behalf of your Syndicate, after examination of certain portions of the country, I visited the Sekenke Mine. This mine needs no comments from me beyond stating that in my opinion it is one of the richest gold mines in the world, recovering, roughly, two ounces to the ton, proved to a depth of 350 feet vertical, and improving as sinking and developing progresses. I have brought some samples from this mine. From Sekenke, a four days' march brought me to another rich auriferous belt of country, and I spent considerable time on this spot, and was fortunate enough to secure for your Syndicate four claims of ground, which, from personal observations, examinations and pannings of the reefs running through the different workings, as per sketch supplied, are certainly well worth developing. I herewith hand you fair samples of the main body of reef, cross-cuts and of outcrop.

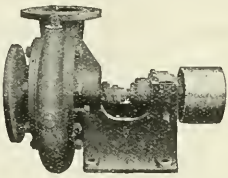
Samples from No. 1 shaft.—Depth, 20 feet; width, 42 inches; assay value, 80 dwts.; depth, 30 feet; width, 45 inches; assay value, 113 dwts. Samples of east cross-cut: Width, 12 inches; assay value, 5.9 dwts.; width, 24 inches; assay value, 13.2 dwts. Samples of west cross-cut: Width, 20 inches; assay value, 3.9 dwts.

Samples from No. 2 shaft.—Depth, 12 feet; width, 24 inches; assay value, 73.8 dwts. Samples of outcrop 200 yards south of No. 1 shaft: Assay value 51 dwts.

Description of the Property.—Situation of property: On the high plateau (3,450 feet) on the goldfields between Tabora and Muanza. The main transport road from Tabora to Muanza passes through these claims.

Geology of District.—As per sketch representing cross section of district. A series of iron stone (gossin) outcrops are running from N.E. to S.W., and these claims are situated on one of these outcrops, which are occasionally intermixed with fragments of banded iron stones and quartzites. You will observe from sketch No. 1 that a shaft, No. 1, of 30 feet has been sunk on one of the claims, exposing a reef as per samples carrying very good gold by panning, over a width of

CENTRIFUGAL PUMPS.



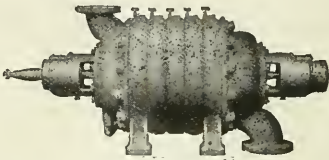
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45 inches, dipping west 85 degrees. A series of smaller reefs and stringers running parallel with the 45 inches reef, exposed in the cross-cuts, but separated by five respectively 6 feet of gangue (quartzitic slate). The foot and hanging walls (quartzitic slate) are well defined. Samples of both walls herewith. The size of each claim is 400 by 200 metres, or roughly, equal to a block of ten claims in Rhodesia, that is, 1,200 feet of strike by 600 feet of dip. The four claims, therefore, total 4,800 feet of strike by 600 feet of dip. A great number of trenches are on these claims, tracing the strike of reef. Here, as in most parts of the country, the overburden is heavy, sometimes being 12 to 14 feet.

Water and Wood.—A river runs through one of the claims. During the dry season most of these rivers are partially dry or water stands in big pools, but by digging five or six feet in the sand, running clear water will be obtained, and this method is adopted by the natives for watering thousands of cattle. On the claims is very little wood, especially for mining purposes, but two and a half miles away to the west very fine mining timber, chiefly acacias, can be had for the price of cutting it down.

Native Labour.—As the country is thickly populated and boys are to be had at from 5s. to 8s. per month, inclusive of food, no difficulty will arise on this point for many years to come. At the Sekenke Mine and at Kassama I have seen these boys working underground, and was told that these natives take very kindly to mining and have no fear of going underground.

Mining Laws.—A copy, in German, of the latest regulations, I am laying before you, and I must say that these regulations are very favourable. Here are a few extracts: After you cease paying prospecting licences (10s. per claim per month) you can have your prospecting licences transferred into diggers' claims. Each hectare (100 by 100 metres) contained in a diggers' claim costs 30s. per annum. Actual work must be started after two years from date of obtaining diggers' licences. The tax on the gold produced is only 1½ per cent., etc., etc.

Climate.—The biggest part of the German East African hinterland is a high plateau about 4,000 feet above sea level, resembling the rolling plains of the Transvaal, and some parts a copy of Southern Rhodesia. The nights are rather cold, and the heat during the day not oppressive, in fact, malaria is very little known, and this plateau is considered healthy. Further comment is unnecessary, personal observation proves to me that German East Africa, in the very near future, will become a large and profitable gold mining centre.

THE BRAKING OF HIGH-SPEED HOISTS.

Important Discussion—Condemnation of Mechanical Brakes Chief Inspector of Machinery on the Question.

Discussing Mr. Chambers' paper on "The Braking of High Speed Hoists," before the South African Institute of Engineers, Mr. J. A. Vaughan (Past President) and Chief Inspector of Machinery, said he wished to congratulate Mr. Chambers on his paper as well as on the success of the eddy current brake as applied to winding engine, the introduction of which (i.e., the Teddy brake as it would probably be called) he believed was largely due to Mr. Chambers' own initiative. He thought a few remarks on the subject, even if disjointed, might be better at this stage than a very lengthy dissertation afterwards, and having had the pleasure of perusing the paper that afternoon perhaps they would bear with him in the remarks he had to make, more especially from a mechanical engineer's point of view. He had watched this brake in action and seen how well it did on the Turf Mines. What struck him first of all, thinking of the original experiment alluded to by Mr. Chambers, was the disc rotating in a magnetic field, this simplicity had been departed from, and in the eddy current brake, as fitted at the Turf Mines shaft, they had now a heavy revolving mass of magnets. He should imagine it was quite possible in the case of a winding engine to have these magnets stationary, and it struck him it might be possible to combine the magnetic effect in the past brake segments for simplicity. It also appeared to him that where they had the metal subject to the eddy current revolving they might possibly have the added effect of air cooling, and so dispense with water cooling. It was mostly a matter of skin heating, and if they were not dealing with any continuous application he was inclined to believe that air cooling might be sufficient. Departing from the brake question, Mr. Chambers placed a great value on the increase in maximum speed attainable under his new safety conditions from 2,000 to 3,500 feet per minute. The shift handling was reduced from 2 hours to 1½ hours. It was a question whether this was really of great advantage. It was a subject on which the mine managers ought to speak, and he hoped they would. One would have thought that with proper generalship the extra half hour per shift would not be of any importance except to engine drivers, banksmen, and onsets. To his mind the maximum speed in deep level winding was more dependent on the state of the guides and the personal comfort of the passengers. Outside of any emergency brake, of course, the driver had to handle this particular brake, and the safe transport of the passenger must always depend on the engine driver. The acceptance of Mr. Chambers' arguments involved their acquiescing in the condemnation of mechanical brakes for high speed winding engines. Were they going to do this? He knew that at the particular mine Mr. Chambers referred to in paragraph 11 of his paper at the initial test the past brakes were found quite as efficient as the electrical brake. Why could they not be kept so? That was a question for the resident engineer to speak about. The mechanical brake had been proved capable both here and on the Continent of retarding and stopping heavy loads falling with great velocity. No doubt they had all heard of the Dortmund Commission, in which one of the important items dealt with was the efficiency of the emergency brake to prevent overwinding. The Commission went into the question of braking heavy loads under great velocity, in vertical shafts. The investigation was entrusted to technical men and professors, and the report which came out in 1905 seemed to imply that the Commission was satisfied with the possibilities of such braking. Professor Klein was entrusted by the Commission in carrying out the experiments for the determination of the co-efficient for friction for various kinds of wood and iron for varying rates of peripheral velocity up to 3,900 feet per minute, and for varying pressures. Many different kinds of wood were experimented with, as well as different arrangements of the fibres. The results which have been published were as follows:—

(1) There is no constant co-efficient of friction for the various kinds of wood on account of the constant difference in density of the material.

(2) The co-efficient for each sort of wood will lie within two limits, and varies with the action that air, water, light, and soil have had on the growth.

They found that poplar was the best wood to be used for brakes, it having the highest co-efficient of friction and being least susceptible to the action of oil. The Commission was not satisfied with laboratory experiments, but they had a practical experiment in a shaft, and the check experiments under working conditions fully agreed with the results obtained on a small scale. He could not exactly agree with the Commission's report in this respect, because the shaft was only 230 feet deep, and he doubted if they attained the velocity of 3,900 feet per minute which was obtained in the laboratory. They had had some experiments to determine the co-efficient of friction in these fields when dealing with Mr. Schweder's safety catch. That was tried under practical conditions, but not under velocities so great as that referred to above. They attained a velocity up to 1,500 feet per minute, and they proved that the co-efficient for iron on iron or iron on wood lubricated and unlubricated was about the same, namely, '125. He mentioned these things just to show that there were possibilities in the mechanical brake yet. What was wanted here was for the mechanical brake to be regularly tested under kinetic conditions. As they were aware, the Government tests as at present laid down were merely statical, but he understood that the modern electrical hoists with the mechanical brakes had, according to specification, to pass a severe kinetic test, and he again mentioned it as a fact that in the particular mine already referred to by the author the tests of the mechanical brakes were quite as satisfactory as those of the eddy current brake. Going a little further, engineers had to decide how the co-efficient was affected when the wood took fire, that was to say when charred wood was riding on iron, and if it was proved that this was unsatisfactory then the advocates of mechanical brake might have to give in. A matter of wonder to him was that the mechanical brake had not been abandoned on the Continent, where electric hoists of large size and high rate of winding were in vogue before they were introduced here. He had thought once or twice with regard to certain accidents that had occurred here that the firing might not have occurred if the brake had been applied more gradually, and the first charring effect so avoided. Did all their accidents here depend on this system of single drum winding? Mr. Chambers had shown the necessity, or at any rate the great advisability, of having an extraneous power emergency brake for every species of electrical winder. He thought it was quite necessary here by practical demonstration to show that the ordinary wooden post brake, if of sufficient area, was suitable and adequate for the work it was called upon to perform on an electrical winder. Tests, of course, should be carried out under ordinary working conditions, and the necessary facilities for overloading existed. They could get any velocity they liked and go practically to any depth. Referring to paragraph 13 of Mr. Chambers' paper, where he alluded to the constantly accelerating moment when lowering men, it must be remembered that the brake pressure was acting on a constant radius, while with a conical drum the lowering moment was a decreasing one. Coming to paragraph 14, where he dealt with the long winds in incline shafts, the necessity for changing levels and winding single, and the fact that a tail rope could not be utilised, would it not be possible in the case of converted winders in which the steam ends were kept in readiness to connect up one side for single lowering and work compressively? Of course the lubrication difficulty might come in here. He thought there were many gentlemen

who were quite prepared to propose a solution of that. In connection with that, he came across, in the September 7th issue of the *Engineering and Mining Journal* an instance of lowering on air compression. An institute of mining men were visiting one of the deep shafts in the Lake Superior district, and the following was an extract from the report of the visit:—"The visitors were taken to the Franklin property, where the new style of hoist, devised by Mr. Edwards, the manager of the property, and worked out as to details by Mr. Nordberg, was observed. With this device, the hoisting is done with one unbalanced skip. In lowering, the hoist is made to act as a compressor and pump

air into a receiver, thus braking the skip in its descent. With this air the load is returned about 700 feet—or about one-fifth the depth of the hoisting shaft, which is 3,300 feet; owing to the unbalanced weight of the cable, which is 1½ inches in diameter, this represents about one-third of the work. When the pressure has fallen in the receiver to 80 lb., a valve opens in the steam pipe leading from the boilers to the receivers, and the rest of the trip is completed, running on a mixture of air and steam. The system works well, but as yet the efficiency has not been tested. The skip holds 10 tons, having a capacity of 223 cubic feet, and weighs about 7 tons, making it the largest in the world."

MINE AMBULANCE WORK.

The Mine Rescue Methods of the Bureau of Mines in U.S.A.

THE following extracts from the report of the United States Bureau of Mines for 1911, just to hand, will be found of interest, as showing what is being done by that Government towards safer mining:

"Early in the investigation of mine disasters it was necessary to provide, in the important coal fields, facilities for enabling engineers to examine mines after disasters, while the mines were still full of poisonous explosive gases, in order that examination might be made while the evidences of a disaster were still fresh. It was found also that such prompt examinations would be useful in opening up those mines and in rescuing miners who might have been entombed. For the above reasons, there has been established in those of the larger coal fields in which mine disasters are most likely, mine safety station or mine-safety cars. Six mine safety stations have been established at Urbana, Ill., Knoxville, Tenn., Seattle, Wash., McAlester, Okla., Birmingham, Ala., and at Pittsburg. Seven mine-safety cars are operated by the Bureau. They were purchased as second-hand cars, at a cost of about £300 each, and equipped at a cost of about £700 each. These cars are distributed in the several mining districts of the States. These cars do not remain at their headquarters, but each within its own district moves from one camp to another. When a serious mine disaster occurs in any district, the car in that district immediately drops its ordinary programme and is carried to the scene of disaster either by special locomotive or by the first available train. The men of the car, together with such local men as have had mine-rescue training, examine the mine as quickly as possible, penetrating the poisonous and explosive gases in it by means of the breathing apparatus that they wear, and aiding in the rescue of any persons who may have been entombed in the mine. In case of a disaster in the coal fields near one of the six stations mentioned above, the miner in charge of this station, with all available rescue and first-aid equipment, proceeds by the first train to the scene of the disaster, and endeavours to accomplish, with the help of locally-trained miners, the purposes mentioned above. At each of these stations there is a supply of mine rescue and fire-aid equipment, all in charge of a practical miner trained in both first-aid and rescue methods. Each mine-safety car has a full supply of rescue and first-aid equipment and of fire-fighting appliances. The personnel of the section consisted of 31 persons, who were stationed on or at the various cars and stations. Each car had a mining engineer in charge and a foreman miner and a first-aid miner, both trained in rescue and first-aid methods; at Pittsburg the engineer was in charge of the section, with an assistant engineer, a foreman miner, and a first-aid miner. In a number of instances the appliances of the mine-safety car were effectively used in saving life. Since the beginning of this work by the Government at least 15 lives have been saved. The work in the fields has been the more effective because of the co-operation of the mine operators, miners and officials of the miners' organisation. The primary purpose of the cars and stations is not the rescue work that they may accomplish,

but the investigation of mine disasters. The incidental purposes are the development of more efficient mine-safety and first-aid equipment and methods, and the training of local miners at each of the mining camps visited, so that in case of mine accidents of any kind there will be at each mine men ready and equipped to render immediate and valuable assistance. To carry out these purposes the mining engineers of the Bureau examine the safety conditions at mines, advise the mine officials as to the possibilities of improving these conditions, and deliver illustrated lectures to miners, calling their attention to the need of greater care, in safeguarding their own lives and the lives of others. Daily demonstrations of mine-rescue and first-aid equipment and methods are given. Miners are trained in the practical methods of handling such equipment under mine-disaster conditions. As illustrating the extent and importance of this work, attention may be called to the fact that there are more than 700,000 coal miners in the United States. A large majority of these are not from English-speaking countries and have come to this country unfamiliar with mining operations. The fact that more than 100,000 miners attended the lectures and demonstrations, and over 7,000 have received training in mine-rescue and first-aid work in less than one year, illustrated the progress towards safer mining. Permanent results are appearing in the establishment of a considerable number of local rescue and first-aid stations equipped by mining companies and manned by experienced local mining engineers competent to investigate mine conditions, conduct safety demonstrations, and advise mine officials and miners as to methods for preventing mine accidents. With a view to being able to point out the laws and regulations best adapted to prevent accidents in American mining, quarrying and metallurgical industries, the Bureau is bringing together the laws, rules and regulations found to be in force in other important mining countries. This work is now well under way. Copies not only of mining laws, but also of local and even private mining rules and regulations are being collected from different mining countries. As they are received they are carefully examined with a view to determining what provisions may be best adapted to diminishing mine accidents in the United States. This work involves a study not only of the laws as they exist in different countries, but of the important court decisions giving the proper interpretation of these laws and regulations."

In South Africa this work is not touched by the Government Mines Department, but it is left to the private enterprise of the mines and the mine employees themselves, although the Department by means of its regulations enforces the equipment by the mines of necessary apparatus and requires certain officials of mines to hold recognised ambulance associations' certificates as from January 1st, 1913. The enterprise of the Chemical, Metallurgical and Mining Society in obtaining and offering three shields for competition amongst the mine employees of the Union is causing greater interest to be taken in this good work, and attention may be drawn to the fact that entries closed on Saturday last.

THE OCTOBER GOLD OUTPUT IN DETAIL.

Satisfactory Increase Though Not Quite Up to Additional Day's Production—Chief Figures.

Total output	768,681 ozs.
Value	£3,265,150
Increase	20,788 ozs.
Value	£88,304
Rand output	738,082 ozs.
Value	£3,135,172
Increase	21,587 ozs.
Value	£91,697
Outside districts	30,599 ozs.
Value	£129,978
Decrease	799 ozs.
Value	£3,393
Total stamps	9,975
Increase	5
Rand	9,410
Increase	5
Outside districts	565
Tube mills	281

The gold output for the Transvaal for October was declared by the Chamber of Mines to be 768,681 ozs. fine gold of the value of £3,265,150, which is an increase of 20,788 ozs., value £88,304, on the September return. The increase is due to the extra working day month, and is not quite equivalent to the full amount of the average daily yield, but then the decrease for September compared with August was less than the average yield for one day. The increase places the return for October second highest from normal working, i.e., actual production, and the aggregate of the group profits for the month is the highest yet recorded. Therefore the yield and results for October, all things considered, are quite satisfactory. The Witwatersrand production of 738,082 ozs., value £3,135,172, which shows an increase of 21,587 ozs., value £91,697, is only £10,000 short of the extra day average, while the average daily profit is the second highest recorded. The Simmer and Jack East has disappeared as a producing mine, having been purchased by Knights Deep, Ltd., and the abnormal increase of stamps in operation and £36,000 in value in that company's return is due to the production of the two mines being returned by Knights Deep. Outside mines, in spite of the longer working month, make in the aggregate a decline of 799 ozs., value £3,393, for which there is no explanation. Miscellaneous producers, mainly private enterprises, are responsible for more than the shortage compared with September, and it can only be assumed that both labour and water have been difficult and insufficient. The native labour returns, according to the Witwatersrand Native Labour Association figures, show a small increase, but nothing like what might have been expected, taking into consideration the reports which are prevalent of the famine and distress, which the prolonged drought has caused in native territories. The average daily yield for October was £315 less than that for September, but the average daily profit shows an increase of £231 per diem.

LABOUR.

There is an increase for October of 1,083, according to the W.N.L.A. figures, compared with September, on the total employed on gold, coal and diamond mines. There is an increase on gold mines of 1,319, and an increase on coal mines of 20, while diamond mines decreased their complement by 256. The figures for the past three months of the numbers employed by members of the W.N.L.A. at the end of each month read:

	August.	September.	October.
Gold mines	179,111	180,739	182,058
Coal mines	8,766	8,783	8,803
Diamond mines	15,934	15,752	15,496

Totals ... 203,811 205,274 206,357

The following table gives the unskilled labour returns on all mines and on gold mines separately, including contractors' boys, for last month and the preceeding 22 months:

Employed at end of month.

	Total Natives.	Total Labourers on Gold Mines.	Increase or Decrease on Gold Mines.
1911.			
January	201,616	183,268	+ 4,666
February	207,761	189,434	+ 6,166
March	212,011	193,457	+ 1,023
April	213,111	194,328	+ 871
May	209,196	190,392	+ 3,936
June	205,749	186,940	+ 3,452
July	200,758	181,582	+ 5,358
August	199,284	179,810	+ 1,772
September	199,139	179,619	+ 191
October	198,591	179,194	+ 425
November	194,850	176,736	+ 2,458
December	195,249	178,282	+ 1,546

1912.

January	201,375	184,046	+ 5,764
February	209,031	190,320	+ 6,274
March	217,017	196,748	+ 6,128
April	220,086	197,937	+ 1,187
May	216,827	193,929	+ 4,108
June	212,573	188,194	+ 4,254
July	207,256	182,925	+ 5,569
August	203,811	179,111	+ 3,814
September	205,274	180,739	+ 1,628
October	206,357	182,058	+ 1,319

THE STAMP POSITION.

The stamp position for the whole of the Transvaal shows an increase of five accruing from the Rand. Outside districts return the same number as for September. The details of the changes are:—Increases; Jupiter, 10; Knight Central, 5; Knights Deep, 150; Randfontein Central, 50; Van Ryn, 5; miscellaneous, 5. Decreases; Consolidated Langlaagte, 50; Robinson Deep, 20; Simmer and Jack East, 150. The Simmer and Jack East decrease is balanced by Knights Deep increase. There were 272 tube mills operating on the Rand and nine in outside districts.

THE FIRST DOZEN COMPANIES.

The following are the details of production of the twelve leading companies:

	Stamps.	Tube Mills.	Tons Crushed.	Value.
Randfontein Central	750	29	217,089	£270,644
Crown Mines	660	25	167,800	258,927
East Rand Proprietary	820	25	148,500	216,181
Ferreira Deep	225	6	51,900	114,421
Robinson	250	6	53,200	102,370
New Modderfontein	180	7	47,400	93,187
Rose Deep	300	7	68,000	92,868
Brakpan Mines	150	7	60,900	92,439
Village Main Reef	220	5	42,500	89,648
Simmer and Jack	320	7	75,200	82,584
Knights Deep	400	9	100,400	81,981
Nourse Mines	260	7	56,200	79,670

Totals ... 4535 140 1,092,089 £1,604,920

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GROUP PROFITS.

The following are the profits returned for August, September and October by the mines controlled by the different groups:

	August.	Sept.	October.
Rand Mines	£255,747	£245,942	£246,000
Eckstein group	220,285	220,890	237,227
Gold Fields group	97,431	99,432	108,226
Robinson group	97,502	98,105	102,235
East Rand Proprietary	90,450	87,502	91,016
Barnato group	69,525	69,611	71,089
General Mining group	63,981	63,505	62,921
Neumann group	58,001	59,257	60,085
Cons. Mines Selection	40,383	40,131	41,375
Kleinfontein group	21,568	20,015	23,497
Goerz group	13,630	10,834	12,535

Totals £1,028,515 £1,015,224 £1,056,246

For the years 1909, 1910 and 1911 the group working profits are:

	1909.	1910.	1911.	1912.
January	927,161	825,380	813,470	811,637
February	858,101	787,051	791,611	812,954
March	896,779	814,672	825,498	1,090,114
April	908,080	836,310	843,685	897,968
May	917,968	857,334	829,702	959,800
June	921,201	832,305	847,641	1,087,905
July	904,475	848,767	840,471	1,018,880
August	889,609	862,136	799,776	1,028,515
September	874,281	850,174	817,223	1,015,224
October	859,761	851,792	807,237	1,056,246
November	870,882	852,637	824,483	—
December	854,187	862,081	855,758	—

OUR MONTHLY TABLE.

The following is our usual monthly table:—

Company.	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value.
Aurora West	11,458	80	4,415	£18,754
Bantjes Consolidated	24,650	85	8,516	36,174
Brakpan Mines	60,900	150	21,762	92,439
City Deep	43,100	150	18,561	78,842
City and Suburban	26,837	150	11,954	50,777
Cinderella Consolidated	18,320	80	5,922	25,155
Consolidated Langlaagte	34,700	90	10,178	43,237
Consolidated Main Reef	22,072	100	8,678	36,865
Crown Mines	167,800	660	60,956	258,925
Durban Roodepoort	11,131	90	3,585	15,228
Durban Roodepoort Deep	25,570	100	9,308	39,538
East Rand Proprietary	148,500	820	57,956	246,181
Ferreira Deep	51,900	225	26,937	114,421
Goldenhuis Deep	48,500	300	18,726	79,543
Ginsberg	15,215	80	5,133	21,801
Glencairn Main Reef	21,567	160	4,173	17,726
Geduld Proprietary Mines	13,960	50	4,471	18,992
Jupiter	42,800	100	10,929	46,423
Jumpers cum Treasury	6,000	60	3,401	14,447
Knights Deep	100,400	400	19,300	81,981
Knight Central	21,940	110	6,969	29,602
Lancaster	20,750	100	5,350	22,725
Langlaagte Estate	54,751	200	15,166	64,421
Luipaardsvlei Estate	11,700	60	3,598	15,283
Main Reef West	17,827	90	6,405	27,207
May Consolidated	14,700	100	3,960	16,821
Meyer and Charlton	14,116	75	7,218	30,660
Modderfontein B.	32,160	80	12,932	51,932
New Goch	26,775	120	6,173	26,221
New Heriot	11,800	70	5,066	21,519
New Kleinfontein	51,000	210	17,357	73,728
New Modderfontein	47,100	180	21,938	93,187
New Primrose	25,100	160	8,430	35,808
New Rietfontein Estate	15,320	120	4,582	19,463
New Unified	14,585	60	4,005	17,012
Nourse Mines	56,200	260	18,756	79,670
Princess Estate	20,000	60	6,176	26,234

Company.

	Tons Milled.	No. of Stamps.	Total Gold obtained. Fine Ozs.	Total value.
Robinson	53,200	250	24,100	102,370
Robinson Deep	50,100	160	17,900	76,034
Randfontein Central	217,089	750	63,715	270,641
Roodepoort United	30,502	50	7,196	30,567
Rose Deep	68,000	300	21,863	92,868
Simmer Deep	55,200	130	10,345	43,943
Simmer and Jack	75,200	320	19,442	82,584
Simmer and Jack East	34,326	150	6,876	29,207
Spes Bona Tribute	6,119	40	1,572	6,678
Van Ryn	39,230	140	13,065	55,497
Village Deep	50,100	180	18,050	76,672
Village Main Reef	12,500	220	21,105	89,648
Vogelstruis Estate	12,013	70	3,088	13,117
West Rand Central	1,987	20	813	3,453
West Rand Consolidated	29,050	100	9,751	41,120
Witwatersrand	38,870	220	11,110	47,192
Witwatersrand Deep	38,850	245	12,538	53,258
Wolluter	28,800	120	8,895	37,784
Miscellaneous producers	—	—	4,592	19,505

HEIDELBERG—

Nigel	13,750	75	4,623	19,637
Sub Nigel	4,574	30	2,392	10,161

BARBERTON—

Barrett	—	—	314	1,334
Sheba—Rosetta	670	20	349	1,482
Sheba	5,920	60	3,165	13,118
Worcester Exploration	5,300	40	1,180	5,012

LYDENBURG—

Glynn's Lydenburg	3,684	20	1,897	7,676
Transvaal G.M. Estates	15,200	75	9,711	41,390

KLERKSDORP—

Miscellaneous producers	—	245	7,024	29,838
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INCREASES AND DECREASES.

The following returns of the October output have been filed with the Chamber of Mines. Increases and decreases compared with September are appended:

The Witwatersrand.

	Sept.	Oct.	Inc.	Dec.
£	£	£	£	£
Aurora West	18,063	18,754	671	—
Brakpan	90,753	92,439	1,686	—
Bantjes	36,382	36,174	—	208
Cinderella	23,656	25,155	1,499	—
Consolidated Langlaagte	32,164	43,233	11,069	—
Consolidated Main Reef	32,185	46,862	14,677	—
Crown Mines	245,366	258,925	13,559	—
City and Suburban	50,896	50,777	—	119
City Deep	72,281	78,842	6,558	—
Durban Roodepoort Deep	36,938	39,538	2,600	—
Durban Roodepoort	14,922	15,228	306	—
E.R.P. Mines	210,931	216,181	5,250	—
Ferreira Deep	106,265	114,421	8,156	—
Goldenhuis Deep	72,526	79,543	7,017	—
Glencairn	16,927	17,726	799	—
Ginsberg	21,343	21,801	458	—
Geduld	19,000	18,992	—	8
Jupiter	48,175	46,423	—	1,752
Jumpers cum Treasury	13,501	11,447	—	943
Knight Central	25,591	29,602	4,011	—
Knights Deep	15,362	81,981	36,619	—
Luipaardsvlei	16,592	15,283	—	1,309
Lancaster West	19,756	22,725	2,969	—
Langlaagte Estate	63,975	64,421	446	—
Main Reef West	28,583	27,207	—	1,376
Meyer and Charlton	30,660	30,660	—	595
Modder B.	56,711	51,932	—	1,779
May Consolidated	16,885	16,821	—	64
New Rietfontein	19,595	19,163	—	432
New Kleinfontein	68,002	73,728	5,726	—
Nourse Mines	82,899	79,670	—	3,229
New Modder	91,725	93,187	1,462	—
New Primrose	36,250	35,808	—	442
New Goch	26,336	26,221	—	115
New Unified	16,659	17,012	—	353
New Heriot	22,169	21,519	—	650
Princess Estate	25,920	26,234	—	314
Rose Deep	89,708	92,868	3,160	—

	Sept. £	Oct. £	Inc. £	Dec. £
Randfontein Central	259,944	270,644	10,700	—
Robinson	101,457	102,370	913	—
Robinson Deep	81,595	76,034	—	5,561
Spes Bona	6,182	6,678	196	—
Simmer Deep	45,837	43,943	—	1,894
Simmer and Jack	81,777	82,584	807	—
Rodepoort United	28,829	30,567	1,738	—
Van Ryn	54,902	55,197	595	—
Village Deep	75,342	76,672	1,330	—
Vogelstruis	11,894	13,117	1,223	—
Village Main	84,768	89,648	4,889	—
Witwatersrand	45,825	47,192	1,367	—
West Rand Consolidated	39,198	41,420	2,222	—
Wit. Deep	57,332	53,228	—	4,074
Wolhuter	37,779	37,784	5	—
West Rand Central	3,653	3,453	—	200
Miscellaneous	19,239	19,505	266	—
<i>Outside Districts</i>				
Barratt	990	1,334	344	—
Glynns Lydenburg	8,623	7,676	—	947
Nigel	18,546	19,637	1,091	—
Sheba Rosetta	1,461	1,482	21	—
Sub Nigel	8,636	10,161	1,525	—
Sheba	13,724	13,448	—	276
Trans. G.M.E.	42,915	41,390	—	1,525
Worcester	4,719	5,012	293	—
Miscellaneous	33,757	29,838	—	3,914

Robinson Group.

The following are the results for October at the Robinson Group of Mines: Langlaagte Estate: Tons milled, 54,754; total yield, 15,166 fine ozs.; estimated profit, £17,575 (7s. 5.03d. per ton milled). Randfontein Central: Tons milled, 217,089; total yield, 63,715 fine ozs.; estimated profit, £84,662 (7s. 9.59d. per ton milled). Totals: Tons milled, 271,843; total yield, 78,881 fine ozs.; estimated profit, £102,237.

Jumpers-cum-Treasury.

The following is the result of the joint working of the Jumpers and Treasury mines during last month: Sixty stamps working 25 days crushed 6,000 tons, yielding 1,764 ounces of fine gold from mill, 962 ounces of fine gold from tailings by cyanide, 243 ounces of fine gold from current slimes, and 432 ounces of fine gold from accumulated slimes—total from all sources, 3,401 ounces of fine gold; value of output, £14,284; joint profit for the month, £2,265; position of joint gold reserve at end of month, 842 ounces of fine gold.

QUARTERLY REPORTS.

Neumann Group.

The results of operations on the mines of the Neumann Group for the quarter ended the 30th of September are as follows:—

MAIN REEF WEST.

Tons milled, 59,094; gold recovered, 22,268.545 ozs.; revenue from gold, £93,276; total working expenditure, £62,160; cost per ton milled, 21s. 0.45d.; profit for quarter, £31,116; profit per ton milled, 10s. 6.37d.; capital expenditure, £13,159. On development work, 3,332½ ft. were driven, risen and sunk, including prospecting work. Excluding main cross-cuts, ore passes and prospecting work, 2,165½ ft., or 68.1 per cent., has been on leader and main reef combined, and of this 1,907½ ft. have been sampled. Of this 86½ ft., or 45.5 per cent., has been payable, of an average value of 7.5 dwts. over 48 ins. And 1,042 ft., or 54.5 per cent., has been unpayable, of an average value of 3.7 dwts. over 48 ins.. The ore reserves as at 30th June were 682,720 tons; ore developed for quarter, 46,250 tons—total, 731,970 tons; less ore mined for quarter, 67,878 tons; less difference in stopping width, etc., 8,958 tons—total, 58,920 tons; which made the ore reserves as at 30th September 673,050 tons. On shaft sinking, 462 ft. have been sunk and timbered in the No. 5 shaft, making a total to date of 3,492 ft.

CONSOLIDATED MAIN REEF.

Tons milled, 68,631; gold recovered, 23,557.965 ozs.; revenue from gold, £98,584; total working expenditure, £66,665; cost per ton milled, 19s. 5.125d.; profit for quarter, £31,919; profit per ton milled, 9s. 3.62d.; capital expenditure, £12,650. On development work, the west incline shaft has been sunk 88 ft. to 3,845 ft., or to 145 ft. below the 21st station. The total footage driven, risen, sunk and prospecting work was 4,332½ ft. Excluding main cross-cuts, ore passes and prospecting work, 2,906 ft., or 81.6 per cent., has been on reef. Of this 1,718 ft., or 59.2 per cent., has been payable of an average value of 7.8 dwts. over 48 ins. And 1,188 ft., or 40.8 per cent., has been unpayable of an average value of 2.2 dwts. over 48 ins. Of the payable portion 1,347½ ft., or 80 per cent., has been on main reef leader, averaging 8.4 dwts. over 48 ins. And 34½ ft., or 20.0 per cent., has been on south reef, averaging 5.5 dwts. over 48 ins. Ore reserves at 30th June were 610,680 tons; ore developed for quarter was 70,960 tons, making a total of 681,640 tons; less ore mined for quarter, 78,456 tons; less difference in stopping width and main reef mined, but not shown in reserves and from stopes previously called unpayable, 18,386 tons—total, 60,070 tons; which made the ore reserves at 30th September, 621,570 tons. At No. 3 shaft, seven compartment, 123 ft. have been sunk and timbered, making a total depth to date of 1,993 ft. A station has been cut corresponding with the 20th level of the west incline shaft.

KNIGHT CENTRAL.

Tons milled, 69,820; gold recovered, 20,386.379 ozs.; revenue from gold, £85,119; total working expenditure, £69,279; cost per ton milled, 19s. 10.14d.; profit for quarter, £16,170; profit per ton milled, 1s. 7.58d.; capital expended, £9,871. On shaft sinking and stations,

the east shaft has been sunk 153½ ft. to a total depth of 4,380½ ft., or to 154 ft. below the 15th level. The last 50½ ft. have been sunk in dyke. One hundred and sixty-five feet of sills have been put in to a depth of 4,308 ft. The west shaft has been sunk 190½ ft. to a total depth of 4,289 ft., or to 346½ ft. below the 13th level. The last 292 ft. have been sunk in dyke. Ninety feet of sills have been put in to a depth of 4,065 ft. On development work there were driven, risen, sunk and on prospecting work a total of 2,305 ft. The reef values were:—Exclusive of main cross-cuts, ore passes and prospecting work, 1,280 ft., or 83.81 per cent., of the development work has been on reef. Altogether 1,665 ft. have been sampled, comprising 880 ft., or 53.0 per cent., averaging 8.03 dwts. over an estimated stopping width of 62.84 ins., and 785 ft., or 47.0 per cent., averaging 1.88 dwts. over 62.12 ins. In this former total is included 345 ft. of main reef at 7.50 dwts. over 57.72 ins., 525 ft. of south reef at 8.34 dwts. over 66.62 ins., and 10 ft. of main reef leader at 7.91 dwts. over 41 ins. *Ore Reserves.*—The payable ore exposed as at 30th June was 658,000 tons at 6.05 dwts. over 60.77 ins.; payable ore exposed or developed during quarter ended 30th September was 48,500 tons at 6.90 dwts. over 70.63 ins.; making a total of 706,500 tons at 6.11 dwts. over 61.36 ins.; less ore mined from payable blocks during quarter ended 30th September, 1912, 52,900 tons. The total ore reserves at 30th September were 653,600 tons at 6.11 dwts. over 61.36 ins. Extensions have been made to the change room for Europeans at the west shaft, and a change room for natives has been built at the east shaft. What is known as the Simmer and Jack dyke has been intersected in both the west and east incline shafts. At the west shaft a borehole is being put up to determine its exact thickness, and also to locate the position of the upthrown portion of the reef.

WITWATERSRAND DEEP.

Tons milled, 112,610; gold recovered, 39,188.326 ozs.; revenue from gold, £164,163; total working expenditure, £108,684; cost per ton milled, 19s. 3.63d.; profit for quarter, £55,479; profit per ton milled, 9s. 10.21d.; capital expenditure, £7,119. On shaft sinking, the east shaft has been sunk 17ft. to a total depth of 2,895ft. The west auxiliary incline has been sunk 157 feet, to a total depth of 1,187 feet. On development, drives, raises, winzes and drives from stopes, the total footage for the quarter was 2,870 feet. Of the total development 2,098.5 ft., or 73.12 per cent., has been on reef. Altogether 1,818 ft. have been sampled. This total comprises 1,468 ft., or 80.75 per cent., averaging 8.6 dwts. over 48 inches, and 350 ft., or 19.25 per cent., averaging 2.06 dwts. over 48 inches. *Ore Reserves.*—Payable ore exposed as at 30th June, 1,369,180 tons at 6.87 dwts. over 48.83 ins.; payable ore developed during quarter ended 30th September, 45,220 tons at 8.49 dwts. over 48.00 ins.; total, 1,414,400 tons at 6.92 dwts. over 48.80 ins.; less ore mined from payable blocks during quarter ending 30th September, 82,057 tons. The total ore reserves at 30th September were 1,332,343 tons. The amount of water pumped for the quarter was 173,151,100 gallons, and cost £6,519 15s. 6d. to pump, equal to 1s. 1.90d. per ton milled. The cross-cut on the 16th level has intersected the reef south of the water dyke, and 31 ft. of driving on the main reef leader averages 12.4 dwts. over 48 ins.

Rhodesian Section.

LATEST MINING NEWS.

Reported Increase of Matabele Queen's Plant—The Farvie—Portland Cement in Rhodesia—Cam and Motor—Planet Arcturus—Scottish Mashonaland—Native Labour in Rhodesia—The Prince of Wales Mine—Shamva Developments—The Lonely's Ninth Level—The Toronto—Susanna Developments—Mr. McAdams and the Masterpiece—Rezende Outputs.

THE Matabele Queen's Mine has of late been announcing good returns, and a good deal of credence is accordingly being given the report that the management is arranging to double the milling plant, which at present consists of 10 stamps. In the month of September 1,550 tons of ore were milled. The mill recovery was valued at £2,048, that from the sand at £1,586, and from slime £373. The property is understood to be looking uncommonly well at present, and an extension of equipment would appear thoroughly warranted.

* * * *

In the High Court at Bulawayo last week, before Sir Joseph Vincent, on the application (unopposed) of Mr. Le Bas, the award of the arbitrators in the dispute between Mr. Herbert Stephen Henderson and Rhodesia, Ltd., was made an order of Court. The arbitrators awarded Mr. Henderson £1,850 damages, the costs of reference to be paid by the company. Their findings were as follows: (1) That the company had given the claim-holder notice of termination of lease as on March 25th, 1912; (2) that the company was using water from the Farvie mine for the purpose of crushing its own ore other than Farvie ore on April 27th, 1912, and after that, as alleged in the deed of submission; (3) that the company had no right to use such water for crushing and treating ore other than ore from the Farvie mine.

* * * *

A movement is on foot which has for its object the establishment of a new industry in Bulawayo. This takes the form of a Portland cement factory, which it is proposed to erect on the Commonage. A company is now in course of formation in connection with the enterprise. The promoters have secured rights from the Government over an area on the Tuli Road (about 14 miles from town) containing enormous deposits of material said to be suitable for the manufacture of a high-grade Portland cement, which, it is claimed, exhaustive tests have proved to be equal to the best imported. Some samples which have been exhibited appear to confirm this statement. Expert opinion is particularly sanguine as to the importance of the discovery, and it is confidently predicted by the promoters that it will lead to the establishment of an important industry. Application has been made to the Town Council for a site on which to erect the factory. Meanwhile, the syndicate which has been formed is taking active steps to organise the industry. The engineer to the syndicate is Mr. Allan T. Hall, and the secretary Mr. W. T. Fleming.

* * * *

The following official particulars have been sent to the London board of the Cam and Motor G.M. Co. by cable:—"Motor Mine—Total footage driven and sunk for September is 258 feet. No. 5 level—Main south drive, drive extended 80 feet, a total of 298 feet; reef 72 inches wide, assaying 7 dwts. per ton; the last 20 feet driven average value 10½ dwts. East crosscut off south drive, 155 feet south of shaft No. 1, the first 3 feet assaying 9½ dwts. Payable width exposed by crosscut south at 205 feet from the shaft, total 13½ feet, average value 8½ dwts. West crosscut off south drive 255 feet south, present width is 3 feet, value 15 dwts.; still in ore. No. 6 level—Main crosscut extended 54 feet, in

contact with hanging wall at 74 feet, and struck large body of water; work is delayed temporarily; assays later on."

* * * *

The following is a copy of a cable despatched on the 1st inst. from Bulawayo to the board of the Planet-Arcturus G.M. Co., Ltd., in London:—"The following are latest developments Slate mine: 4th level east drive in high-grade rock, last 12 feet average assay value 191 dwts. over 52.5 inches, not reduced; last 160 feet average assay value not reduced 58.6 dwts. over 33 inches, reduced 20.3 dwts.; widths not fully exposed. Winze No. 2 C, 150 feet east of above drive also shows similar formation and values, visible gold in faces of winze and drive. Arcturus mine developments continue satisfactory."

* * * *

The income of the Scottish Mashonaland from dividends during the twelve months ended with June was £2,336, as against £3,215. A profit was made from share realisations of £305, against a loss a year ago of £938, so that the profit for the year is £121 more at £826. The investments, standing in the books at £128,250, have further depreciated. On June 30, 1911, the quoted securities had a market value of £91,448; on June 30 last the market value was £70,267, and at the end of last month £77,228. The principal holding is 20,520 Gold Fields Rhodesian Development shares. As compared with the previous year, the investments are described as being "practically unchanged," but the accounts indicate that a sum of £5,040 has been invested.

* * * *

A correspondent, writing to the *Rhodesian Mining Review* on the subject of native labour, makes the following interesting remarks:—"The latest statistics published with regard to native labourers employed on mines in Southern Rhodesia show that in August this year there were in employment 5,104 fewer than in the same month of 1911. Comparing the "distribution" returns of the Rhodesia Chamber of Mines for the month of July, 1912, with the month of July, 1911 (the August distribution figures are not yet out), it will be seen that there were employed on:

	July, 1911.	July, 1912	Decrease in 1912.
Producing gold mines	21,874	21,264	610
Non-producing gold mines	15,960	13,906	2,054
Coal and other mines	1,648	1,461	187
	42,482	39,631	2,851

The shrinkage would appear to be principally in respect of prospecting operations, and may indicate either the want of a market for new finds or concentration of work on ground already pegged. Shortage of water and the high prices of native foodstuffs also suggest themselves as reasons for employing as few boys as possible under existing conditions. That there has been little difference so far as the output of gold and other metals are concerned is shown by the August returns, which give 177 producers crushing 136,967 tons for a yield of the value of £259,417, against 174 producers in August, 1911, crushing 141,214 tons yielding £261,483 value. While it is unquestionable that the employment of 5,000 fewer boys by our principal industry—which, be it remembered did not require any more boys at that period—has a

noticeable effect upon railway receipts, customs and the volume of business, there is no reason for supposing that it indicates any serious set-back. There is reason to think that, as usual when money is tight, work has been stopped or restricted on the less promising propositions. Such a weeding-out occasionally does no harm in a country where the number of prospects is so great. On the contrary, it may serve the useful purpose of reminding the less careful members of the mining community to restrain the type of enthusiasm which takes the form of unwillingness to accept the fact, while there is still time, that their property is unpayable. Such obstinacy is often the cause of disaster.

* * * *

The following cablegram was despatched from the Prince of Wales mine, Bulawayo on Monday to the board in London of the Asp G.M. Co., Ltd.:—"Reef has been struck No. 2 level south crosscut 55 feet in, assaying on the east side 8.3 dwts. over 7½ feet; on the west side 9 dwts. over 7½ feet."

* * * *

The following is the latest news from the Shamva mine as cabled by the local office of the company to London:—"Winze to No. 4 level from No. 3 crosscut north, 100 feet sunk, last 5 feet average assay value 5.68 dwts. over 47 inches. Winze to No. 4 level from No. 5 crosscut north, 7½ feet sunk, average assay value 5.14 dwts. over 52.5 inches. Gully adit, west drive, from 140 to 147½ feet, average assay value 3.940 dwts. over 44 inches."

* * * *

The following report of developments on the 9th level of the Lonely mine was cabled to the London board of the company in mail week:—"No. 9 level, south drive sampled again over regular sections of 5 feet; for 15 feet exposed, average width of reef 28 inches assaying 5 ozs. 8½ dwts.; previous samples have been taken irregular intervals; reef now 43 inches wide."

* * * *

During mail week the following cablegram was despatched from the Toronto mine (in the Umali area) to the London office of the Toronto (Rhodesia) Syndicate:—"Main shaft sunk to a depth of 80 feet. Lucktor adit extended to 482 feet. Adit No. 4: Have followed the ore down by a winze for 40 feet; the average of the samples from this winze below 15 feet is £1 15s. per ton; the average width is 2 feet 3 inches."

* * * *

The following is an official account of recent development on the Susanna mine:—"Tenth level.—South drive, reef 6 inches wide, pans 1 oz.; spur reef drive, 16 inches wide, pans 1 oz.; north ore body, winze down 30 feet, reef 31 inches wide, pans 8 dwts. Ninth level.—Winze down 38 feet, reef 34 inches wide, pans 15 dwts. Eighth level.—Stope reef 9 inches wide, pans 12 dwts.; underhand stope, south reef north, 60 inches wide, pans 15 dwts., south end pans 10 dwts. to 20 dwts., 7 inches wide. Seventh level.—Stope drive on N shoot, heading now in 62 feet, reef 9 inches wide, pans 5 dwts.; spur reef, 9 inches wide, pans 1 oz.; old drive No. 7 picked up the spur reef, ore over 1 oz. in the pan.

* * * *

Mr. J. McAdams, who has the controlling interest in the affairs of the Masterpiece G.M. Co., Ltd., has decided to shut down for the present, pending the decision of the Court as to the exact position of the company. The case is expected to come on in Salisbury before the end of the year. Meanwhile Mr. McAdams is doing well on the Mali mine, which produced a record output last month.

* * * *

The following are detailed particulars of the Rezende output for September, showing a total profit of £2,273:—Rezende Section: Estimated value of yield (gold and silver), 35s. 3d. per ton; working expenses, 27s. 10d. per ton; estimated gross profit, after deducting London expenses, £1,519, or 7s. 4.917d. per ton; and revenue from tributors, £496. Penhalonga Section: Estimated value of yield (gold, silver and lead), 23s. 7d. per ton; working expenses, 22s. 8d. per ton; estimated gross profit, £258, or 11.057d. per ton. Office note:—"High costs per ton are due to low tonnage milled, owing to scarcity of native labour."

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Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Illogical Precision in Mine Reports.

To the Editor, *South African Mining Journal*.

Sir,—In last Saturday's *Mining Journal* you have further commented on the above-mentioned subject, but, judging from the following statement, it would seem that you had completely mistaken my argument: "For our part, we adhere to our original opinion that it is far better to maintain the more customary practice of stating ore reserves, tonnages milled, etc., exactly as they are arrived at rather than depart from the mathematically moral path by ever so little. . . ." This statement implies the direct opposite to the substance of my paper. My contention is that in all cases where ore reserves or mill tonnages are expressed in units manifest departures have been made from the mathematically moral path, the reason being simply that such extreme accuracy is prohibited by the essentially approximate nature of the factors involved in the calculations. My plea has been that moral and mathematical principles should be respected instead of being ignored, and that calculations should therefore be expressed to the degree of accuracy warranted by the exactness which has been observed in determining the component factors.—Yours, etc.,

J. PERCY ROLFE.

Box 15, Langlaagte, Nov. 11.

[Mr. Rolfe's views are dealt with elsewhere in this issue.—Ed.]

Diamond Cutting Again.

To the Editor, *South African Mining Journal*.

Sir,—While thanking you for giving me space to reply to "Reader," may I ask you to extend your courtesy further to allow me to advance some arguments that I was prevented from bringing forward in my previous communication for fear of making it too lengthy. Any diamond factory in South Africa would have to cut principally high-class goods, the value of which, in a rough state in Europe, would be worth from £5 to £12 10s. per carat, including a duty of 25 per cent.; while the same goods would be only £4 to £10 per carat in this country. This addition would have to be paid by the Amsterdam cutter for his goods. Taking then a possible higher wage here of say even 25 per cent., it would work out thus: At a cost of cutting of say 20s. per carat, a £4 per carat stone would work out at £6 per carat, duty paid, in Amsterdam, as against £5 5s. here. At £10 per carat, plus cutting charges as given, the local cost would be £11 5s., as against £13 10s. duty paid in Amsterdam. Waste in cutting is not taken into consideration in either case. It will be seen, therefore, that the better gems would be cut here at higher wages, and the inferior only, if at all, go to the factories in Europe. Evidently America on a high wage gets the good rather than the poorer stones, and that is the way it would work here. For choice I would prefer the European cutter to handle the low class stones—they are not so profitable. The hoard and rubbish should never be shipped at all as diamonds, but only as carbon dust after being reduced to powder. It is the shipment of hoard that gives the idea that diamonds are of small value; whereas the good stuff is still rare and valuable. There is always a tendency, in wool and other products as well, for the poor quality to pull down the values of the better class. The stress laid by the *Cape Argus* on the value of "hereditary talent" in diamond cutting is on a par with such a view as applied to miner's phthisis or *delirium tremens*. What the Hollander can do as a descendant of the Huguenot, who left France for religious liberty, his descendant here can also do. But anyway the talent is transferable here as to America. What is wanted in Africa is high-class well-paid

employment for those now growing up without industrial training. In my experience as a diamond cleaver I am certain that anybody of average intelligence can be trained to competency in one or other of the several branches of the business, though I am quite ready to admit that some would fail, while others would develop exceptionally high technical skill. Even in Antwerp and Amsterdam, perhaps not more than 10 per cent. can be considered artists in the profession. From personal experience, deepened by a recent visit to Europe, I am inclined to challenge the *Cape Argus* affirmation that the cost of living here is greater. In some parts even rent is not much higher, and many necessities of life are cheaper. Luxuries certainly cost more, but, speaking generally, the difference is not so great. In any case, the duty imposed would allow of such wages as would equalise things, as it does with the cutters who have settled in America. The cost of living is coming down in South Africa, whereas in Europe it is constantly rising, as proved by statistics. Another interesting letter also in your columns shows that the action of Mr. Lloyd George, the Free Trade Chancellor, in transferring by law the manufacture of patented articles to Great Britain, received the approbation of all—even his usually severe and adverse critics; what honour will accrue to the statesman who succeeds in bringing the huge and profitable diamond cutting industry to South Africa? But Mr. Lloyd George is not the only Free Trader who has discovered the fact that it is necessary in some cases to adopt the principle of Protection in regard to home trade. For example, after the discovery of radium by M. Curie, it was found that its source was in Austria, where the pitch blende was alone to be found in payable quantity. A rush came from all over the world to secure this product; but Austria, realising the profitable nature of the manufacture of so valuable a mineral as radium, and to compel its manufacture locally, not only did not content itself with a tax such as we ask for rough diamonds, but passed a law actually prohibiting the export of pitch blende, thus securing the immense value of the discovery for its own advantage. Radium is therefore exported from Austria just as we might export cut polished diamonds to Europe, America and the rest of the wealthy world. This last statement can be verified by reference to the work recently published by Mme. Curie, and available at the Public Library. These two examples of protective commonsense should have weight with the thinking man in this poor country.—Yours, etc.,

November 12.

A. JUDLIN.

ANSWERS TO CORRESPONDENTS.

"Rhodesian."—We quite agree with your remarks, but your language is too strong, and no good purpose would be served in publishing your letter. The matter was settled in the English Law Courts, and no doubt De Beers are within their rights.

"Cape."—If you will read Mr. Hay's letter in last week's issue, we think you will agree that he has covered the same ground, and his knowledge of the subject, you must admit, is superior to your own.

"Protectionist."—Your letter is too long, and too political for production in this journal. The tax has been suggested, and no one has insisted that Johannesburg should necessarily be the headquarters of the diamond cutting industry. No doubt the politicians of the Cape would protect Capetown.

"E. P. D." (Germiston).—Your letter is held for consideration.

THE WEEK IN THE SHAREMARKET.

Firmer—Improving International Situation Eases Strain.

THE latest available evidence goes to show that the European Powers are working for peace, and markets are beginning to take a more cheerful view of the outlook. Austria and Servia seem to recognise the serious consequences of a quarrel between them, and desperate efforts are being made on all sides to prevent an outbreak. Turkey, apparently, is finished, and the Porte will have to pay heavily for peace. Should the outlook brighten, the South African market would be one of the first to respond, as everything here is in train for increased activity. Labour is improving daily. It is understood that the Apex-Benoni terms will be announced as soon as all interests are satisfied, and that there will be no delay in the hope of better markets. Shareholders will be allowed to participate in the advantages of the underwriting, and every effort is to be made to please everybody. It is thought that the new State mine will not attract many offers owing to the dull market, and the Brakpan people are said to stand the best chance of being successful.

	Friday, 8th.	Sat., 9th.	Monday, 11th.	Tuesday, 12th.	Wed., 13th.	Thurs, 14th.
African Farms	14 9s	14 9	14 6	14 6s	14 6s	14 9s
Apex Mines	24 6	24 6s	24 0s	23 6s	24 0s	24 0s
Bantjes Consolidated	23 6s	23 6s	22 6s	22 6s	23 6s	23 6s
Benoni	4 3s	4 3s	4 0s	4 0s	4 0s	4 0s
Bushveld Tins	0 10s	0 10s	0 10s	0 9s	0 10s	0 10s
Brakpan Mines	77 0s	78 0s	78 0s	77 0s	78 0s	78 0s
Blaauwbosch	26 0s	26 0s	25 0s	26 0s	26 0s	27 0s
British S.A.	25 0	25 0	24 6s	24 6s	24 6s	24 6s
Breyten Collieries	27 6s	30 0s	30 0s	27 6s	30 0s	27 0s
City and Suburban	46 6	46 0s	46 6s	46 3	46 0s	46 6s
City Deeps	57 6s	57 6s	57 0s	56 9s	54 9s	57 0s
Cloverfield Mines	6 4	6 3s	6 0	6 0s	6 3	6 0s
Cons. Langlaagtes	27 0s	26 3s	26 9	26 6	26 6s	27 3
Cons. Main Reefs	19 0s	19 3s	19 0s	19 3	19 3s	19 6s
Coronation Freeholds	0 6s	0 6s	0 6s	0 6s	0 6s	0 6s
Cons. Mine Selections	10 0s	10 0s	10 0s	10 0s	10 0s	10 0s
Clydesdales	8 9s	8 9s	8 6s	8 6s	8 6s	8 6s
East Rand Cent.	12 0s	12 0s	11 6s	11 9	11 6s	12 0s
East Rand Coals	2 4s	2 4s	2 6s	2 4s	2 4s	2 4s
East Rand Deeps	2 3s	2 9s	2 6s	2 7s	2 7s	2 8s
East Rand Props.	52 6s	52 6s	55 0	54 6s	54 6s	54 6s
East Rand Deb.	£93	£93	£93	£92	£92	£92
Eastern Gold Mines	1 10s	1 10s	1 10s	1 10s	1 10s	1 10s
Frank Smith Diam.	8 6s	8 9s	8 9	8 6s	8 6s	8 9s
Govt. Areas	22 3s	22 3s	22 0	21 6s	22 3	22 0
Glencoe (Natal) Colls	7 0s	7 0s	7 0s	7 0s	7 0s	7 0s
Geduld Props.	22 9s	21 6s	22 6s	22 6s	22 6s	22 6s
Hex Rivers	3 0s	2 6s	2 6s	2 6	2 6	2 6
Jupiters	11 9s	12 6s	12 0s	12 0	12 0s	12 0s
Klerksdorp Props.	2 9	2 9s	2 9s	2 9s	2 9s	2 9s
Knight Centrals	12 0s	12 0s	12 0	12 0	12 3	12 3s
Luipaardsvlei Estates	10 0s	10 0s	10 0s	10 0s	10 3s	10 3s
Lace Props.	4 0	3 10s	3 8	3 6s	3 6s	4 0
Lydenburg Gold Farms	2 4s	2 4s	2 6s	2 4s	2 4s	2 5s
Main Reef Wests	19 6s	19 0s	19 6s	19 3s	19 3s	19 3s
Modder B's	64 0s	64 0s	63 6	63 6	63 6s	63 6s
Middelvlei Estates	1 4s	1 3s	1 4s	1 3s	1 3s	1 1s
Modder Deeps	40 0s	40 0s	39 6s	39 6s	39 6s	40 0s
New Elias	7 6	7 4s	7 5	7 3	7 3s	7 4s
New Kleinfonteins	25 3s	25 0s	25 3s	25 3s	25 3s	25 3s
New Kleinfonteins	7 9s	8 0	8 0s	7 9s	8 0s	8 3s
New Boksburga	2 0s	2 0s	2 0s	2 3s	2 3s	2 3s
New Geduld Deeps	2 6s	2 6s	2 6s	2 6s	2 6s	2 8
New Eland Diam.	29 0s	30 0s	29 0s	25 0s	25 0s	25 0s
Orange Diamonds	1 3s	1 3s	1 4s	1 4s	1 4s	1 5s
Pretoria Cement Co.	55 6s	55 6	55 6	55 0s	55 0s	55 0s
Princess	9 6s	10 0s	10 0s	9 0s	9 0s	9 6s
Rood, Durban Deeps	24 0s	23 0s	22 0s	22 0s	22 0s	22 0s
Rand Nucleus	2 9s	2 9s	2 8s	2 8s	2 8s	2 10
Randfontein Estates	29 0s	29 0s	28 0s	28 0s	29 3s	29 3s
Randfontein Deeps	5 3s	5 3s	5 0s	5 0s	5 0s	5 0s
Rooiberg Minerals	39 6s	30 9	31 0	30 3s	30 6s	31 0

Buyers.

Sellers.

	Friday, 8th.	Sat., 9th.	Monday, 11th.	Tuesday, 12th.	Wed., 13th.	Thurs., 14th.
Rand Klips	6 2	6 0s	5 9	5 9s	5 10	5 10s
Rose Deeps	7 0s	6 6s	6 6s	6 6s	6 6s	6 6s
Rand Collieries	4 6s	4 6s	4 6s	4 6s	4 6s	4 6s
Ryan Nigels	44 0s	45 0	44 0s	43 0s	43 0s	43 0s
Robinson Deeps	2 9	2 6s	2 6s	2 6s	2 6s	2 6s
Simmer Deeps	4 6s	4 7s	4 5	4 3	4 6	4 8
South African Lands	8 0s	8 3s	8 0s	8 0s	8 3s	8 3s
Sub Nigels	16 0s	16 0s	16 0s	15 9s	16 0s	16 0s
Springs Mines	39 0s	41 0s	41 0s	41 0s	41 0s	41 0s
S.A. Breweries	5 4s	5 4s	5 4s	5 4s	5 4s	5 4s
Shebas	52 0s	52 0s	51 0s	51 0s	51 0s	51 0s
Trans. G.M. Estates	46 0s	45 6s	46 0	45 6s	45 6s	46 0
Trans. Coal Trusts	0 9s	0 8s	0 9s	0 9s	0 9s	0 9s
Temple Tins	18 6	18 0s	18 3	18 0s	18 3s	18 9s
Van Ryn Deeps	12 0s	12 0	11 6s	11 0s	11 0s	11 0s
Village Deeps	1 1s	1 0s	1 0s	1 0s	1 0s	1 0s
Vogel, Cons. Deeps	58 6s	58 6s	58 3s	58 6s	58 6s	58 6s
Witwatersrands	15 3s	15 0s	15 0s	15 0s	15 0s	15 0s
Wolhuters	52 6s	52 6s	51 0s	52 0s	52 0s	51 6s
Wit. Deeps	3 6s	3 6s	3 6s	3 6s	3 6s	3 6s
West Rand Est.	15 3s	15 0s	15 0s	15 0s	15 0s	15 0s
West Rand Con.	25 0	24 6	22 6	22 6s	23 3	24 6s
Zaaiplaats	25 0	24 6	22 6	22 6s	23 3	24 6s

Buyers.

Sellers.

MINING MEN AND MATTERS.

Mr. C. E. Knecht has been appointed consulting engineer to the mines of the Consolidated Mines Selection Group.

Mr. H. P. Webber, Secretary of the Anglo-French Exploration Company, is relinquishing that position to start business on his own account. Among important secretarieships he will take over will be that of the Zaaipplaats Tin Company.

The ordinary general meeting of the Chemical, Metallurgical and Mining Society will be held in the lecture theatre, South African School of Mines, this evening, at 7.45 p.m. In mining papers there will be the reply to discussion on "A System of Keeping Underground Costs and Records," by Mr. G. Hildick Smith, B.Sc.; for final discussion, "Mine Tributing in Rhodesia," by Mr. W. Anderson; for discussion, "So-called Air Blasts and Roof Pressure," by Mr. Tom Johnson; "Farming with Dynamite" (October Journal), by Mr. William Cullen, M.Inst.M.M. The chemical paper for reading is "The Action of Alkalis on Phenolphthalein," by Mr. Dan Ior James, M.A., B.Sc. The metallurgical papers for final discussion are "The Surface Workers on the Rand and their Technical Education," by Mr. F. J. Pooler, B.Sc.—Professor G. H. Stanley will read a contribution to this discussion; "Notes on the Cyaniding of Concentrate," by Mr. Robert Linton; for discussion, "Minor Improvements in Cyaniding Practice," by Mr. Percy T. Morrisby; "Investigation on Magnetically Separated Iron from Mill Pulps," by Mr. A. McCa. Johnston, M.Inst.M.M.; "A Research on a Refractory Gold Ore," by Mr. Morris Green. The paper awaiting reply to discussion is "Zinc Dust Tests," by Dr. W. J. Sharwood, A.R.S.M., M.Inst.M.M.

High Mining Salaries

EARNED by those holding Mining Certificates as Mine Managers, Foremen, Surveyors, Mechanical and Electrical Engineers and Engine Drivers. Private Individual Tuition and Correspondence Lessons where personal tuition is impossible.—E. J. MOYNIHAN, Consulting Engineer, 35 and 36 Cuthbert's Buildings; Box 2061.

Engineering Notes and News.

ELECTRICALLY-DRIVEN WINDING ENGINES IN SOUTH AFRICA.*

[By A. W. BROWN, A.M.I.E.E.]

During a recent stay on the Rand, the writer had good opportunities for observing the progress of the electrification of many of the winding engines which serve the various gold mines, and also the installation of several entirely new electric winding engines. Although the conditions of winding differ from those in this country, there is sufficient that is of general interest to justify a description of a few of the many electrified winders on the Rand.

Perhaps the first point to be noticed is the use of the rectangular shaft, generally served by two, and frequently three, double drum winding engines. These shafts are divided for the entire length of the shaft by the timber shaft framework into compartments, one for each drum and one in addition. There are three general classes of shafts sunk, depending upon the occurrence of the ore body or vein in relation to the shaft mouth. These are:—(1) The inclined shaft, usually sunk on outcrop mines, the shaft following the ore. The inclination is not constant, but varies in accordance with the dip of the vein. (2) The vertical shaft, sunk when the ore lies nearly vertically, or horizontally, or is inclined, but is at a considerable depth below the surface. (3) The compound shaft, comprising, usually, a vertical shaft, which is sunk until the ore is reached, and an inclined shaft, which follows the dip of the ore. In such shafts the ore is brought to the surface from the stations on the incline in a single wind.

The depth—or length—of wind does not at present greatly exceed 4,000 feet for vertical shafts, 5,000 feet along inclines, or 3,500 feet in compound shafts. The limits of depth do not appear to have yet been reached, and the economical limit of depth for a single wind is a subject that is too involved to be discussed fully in a paper of this character. It is fixed in part by the strength of the rope, in part by the dimensions of the winding drums which can be installed, and by other conditions depending upon the output of the mine, cost of power, etc. On the Rand, a rope safety factor of 6 is required by the Government, and this permits of a greater depth than the safety factor of 10 which is usual in England. The low safety factor, however, is discounted somewhat by the practice of employing several layers of rope on the drum, in order to keep the dimensions of the drum as small as possible.

In the majority of the mines, hoisting has to be carried out from several different levels in the shaft, necessitating the use of double-drum hoists with clutched drums, so that the length of the ropes may be adjusted to suit each level, and so permit of balanced hoisting from each station. This alteration of the rope lengths, combined with the timbers between shaft compartments, prevents the use of a tail rope to compensate for the changing balance of the hoisting rope. However, in some of the deep-level shafts, such as Brakpan, City Deep, and Village Deep, hoisting is carried on from only one level, and tail ropes may be, and are, used. In other deep shafts, notably at the Rand Collieries and Cinderella Deep, the changing weight of the winding rope is compensated for by the use of a partly conical and partly cylindrical drum.

The winding drums themselves are generally of cast iron and steel, with cast cleading provided with turned grooves to accommodate the first layer of rope. Small drums frequently have cleading of rolled mild-steel plates, without grooves. Wooden lagging is not often used, nor are there many drums built up of channels, girders, and plates, such as are frequently encountered in England and Wales.

The ore is brought to the surface in self-tipping skips, which deliver their contents into bins fixed in the headgear. This is impracticable for most coal mines at present, but it would be an excellent system for any coal mine in which the entire output could be utilised at the pit-mouth for coking and electric power generation. The headgears of the modern mines are usually of steel. In inclined shafts the skips run on rails, and in vertical shafts either steel or wooden guide rails are used, but never guide ropes. The speed of winding varies between 2,000 feet per minute in inclined and compound shafts (slowing to 1,000 feet per minute around curves at the changes of incline) to 3,500 feet per minute in vertical shafts. Although these speeds are by no means low, they are not so high as those obtaining in many British mines.

In the electric winders, the drums are driven according to circumstances either by direct-coupled slow-speed motors, or by medium-speed motors through gearing. When gearing is used the tendency is to employ a single reduction, with either Citroen or Power Plant double-helical teeth. Good results have been obtained with these gears, with powers as high as 1,000/2,000 h.p., and ratios up to 5:1. The pitch-line speeds in some cases exceed 2,600 feet per minute.

The advantages of the gear-drive are very striking in the case of the alternating-current hoists, as they permit of the use of smaller motors, with higher power factors and efficiencies, and lower prices than those of motors suitable for direct coupling. The gear losses are practically compensated for by the gain in motor efficiency.

* Abstract of Paper read, October 12, before the North of England Institute of Mining and Mechanical Engineers.

The majority of the electric winders on the Rand are supplied with power by the Victoria Falls and Transvaal Power Company, Limited, their usual supply being three-phase at 50 periods and 2,100 volts. The generating stations of this company at present have an aggregate capacity of over 130,000 kilowatts, and are consequently capable of carrying any peak which can be imposed upon them by any winders yet installed. No equalisers are used, and all the hoists are driven either by alternating-current motors taking power directly from the line and controlled by means of resistances in the rotor circuit, or by direct current motors controlled on the Ward-Leonard system. Both the Ward-Leonard and the alternating-current rheostatic systems have their advocates on the Rand.

SURFACE WINDERS.

An interesting installation of electric winders is that at Brakpan No. 2 shaft. This comprises two equipments, one Ward-Leonard and the other alternating-current, erected side by side, and winding similar loads through the same shaft. These two winders are in a seven-compartment shaft, in which there is provision for the installation of a third winder, the system to depend upon the observed behaviour of the present two sets. Of these equipments, the alternating-current hoist is used entirely for hoisting rock, since it has but one economical winding speed; and the Ward-Leonard hoist is used not only for hoisting rock, but for raising and lowering men, tools, timber, and explosives, for shaft-inspection, and for all work requiring easy and accurate speed-control. The following is a description of the Ward-Leonard and alternating-current hoists.—

Duty of each hoist.

Depth of wind, vertical	3,800 feet.
Weight of rock hoisted	10,000 lbs.
Weight of each skip	6,000 lbs.
Weight of each rope	14,000 lbs.
Diameter of rope	1½ inches, making two layers on drum.
Weight of tail rope	11,000 lbs.
Number of drums	2.
Diameter of each drum	11 feet.
Width between cheeks	7 feet.
Revolutions of drums	98 per minute.
Winding speed	3,500 feet per minute.
Winding time	80 seconds.
Tipping time	20 seconds.
Power-supply	2,000 volts, three-phase, 50 periods.
B.H.P. of winding motor	Direct current, 1,400/3,600; alternating current, 1,500/3,750.

Alternating-current Hoist.—From the switchboard the power is led directly to the liquid controller, and thence to the driving motor, which is directly coupled to the drum-shaft. Both drums are loose on the shaft, and are driven through hand-operated tooth catches sliding on leathers screwed to the multi-tooth catches sliding on leathers screwed to the shaft. Whitmore brakes are provided for each drum, applied by weight and released by compressed air obtained from a small motor-driven compressor. The brakes are interlocked so that they cannot be released on an unclutched drum.

Direct-current Hoist.—From the switchboard the power is led to a motor-generator set, comprising:—One 1,500 h.p., three phase 50 volt slip-ring induction motor, running at 120 r.p.m.; one 1,200 kw. direct-current generator; one exciter. The generator field is controlled in the well known manner by supplying current to the winding motor at a varying voltage, depending upon the speed and direction of rotation required. The winding motor is coupled direct to the drum shaft, and, like the generator, is provided with commutating poles. The mechanical equipment of this hoist is a duplicate of that of the alternating-current hoist.

Both hoists are equipped with safety devices for the prevention of overwinding, the direct-current hoist being provided with automatic retarding gear and the alternating-current hoist with the Whitmore over-speed preventer.

(To be continued.)

Finance, Commerce, and Industries.

The President and Secretary of the Transvaal Agricultural

Union submitted a long statement to the Small Holdings Commission last week, in which it was asserted that there was a considerable number of able-bodied men in the Transvaal to-day who desired to secure land, either on the basis of small holdings or of allotments. There were also many men who were anxious to secure a plot of land on which to squat, without any intention of ever doing any practical work, so long as they could loaf on the general community. After various possible objections had been pointed out, the conviction was expressed that there was a necessity for the establishment of a system whereby carefully selected industrial workers might be placed in a position to cultivate an allotment as a means of profitable and pleasurable recreation. The conditions which prevailed in the Transvaal to-day in respect of the supply of agricultural and gardening produce were most deplorable, and it was high time that an end was made of the importation of so great a proportion of foodstuffs. That this could be done was beyond question, but it would never be accomplished as long as there were such large areas of land lying idle. There was a growing tendency among a certain class of farmers to work on shares with natives. To make the most of their possessions in the interest of the country, they should do their duty by producing all that was possible, or their places must be taken by men who, by means of intensive cultivation of a small plot of ground, would become an invaluable asset to the land as a whole.

* * * *

The annual report for 1911 of the operations of the Royal

Operations of the Royal Mint.

Mint was issued last month, and states that the heavy demands for Imperial coins, mentioned in the previous report, were maintained during 1911, nearly 121 millions of such coins being struck, or about a million less than the exceptionally high figure for 1910. A smaller coinage of Imperial bronze more than accounts for this slight decline, the coinage in the precious metals again exceeding that of any previous year. The large increase in the demand for gold coins in recent years resulted in a coinage of over 26 million pieces, a further rise of nearly 8½ millions. Nearly 44 million silver pieces were struck, a number exceeded only in the previous year. The bronze coinage amounted to nearly 41 million pieces, about two million less than in 1910. The volume of the Imperial coinage, and particularly the heavy work entailed by the gold coinage, rendered it impossible to undertake many Colonial coinages in the Department, and large orders, especially for nickel-bronze coins, had to be declined. Over 25 millions of Colonial coins were, however, struck, mainly in silver and bronze. The total coinage during the year amounted to over 146 million pieces, of a currency value of nearly 36 million pounds. The issue of gold coin in 1911 amounted to over 33 million pounds, an increase of nearly eight million pounds over 1910, and more than two and a-half times the average of the previous ten years. Silver issues nearly reached the high figure of 1910, a reduction in the amount taken by West Africa more than accounting for the slight decrease in the total. With the issue of bronze coin, which approximated to the average issue for the last ten years, the total issue of Imperial coin for 1911 amounts to more than 35½ million pounds.

WANTED.

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The Delagoa Bay Chamber of Commerce has submitted

Delagoa Percentage.

the following statement to His Excellency the Governor-General: "The Chamber ventures to call your Excellency's attention to the very serious position produced by the recent alteration in freight rates made by the shipping lines loading to South Africa. As your Excellency is aware, railrage rates have been adjusted several times during the last two or three years in an endeavour to arrive at the percentage fixed by the Mozambique Treaty with the Transvaal, these reductions being based on the presumption that the incidence of freights would remain the same. The position to-day is that the freight rates to the Union ports have been reduced by 5 per cent., whilst to this port they remain the same, thus constituting a preference against this port of 5 per cent. The result of this is to entirely do away with all the preference this port enjoys at present, and to make Durban the cheapest port. To illustrate our point, we may quote the following figures for a line of 100 cases of golden syrup:—Through Durban: Freight, £13 11s. 1d.; port charges and agency, 15s. 8d.; railrage, £38 12s. 7d.; total, £52 19s. 4d. Through Lourenco Marques: Freight, £15 11s. 8d.; port charges and agency, £1 4s. 6d.; railrage, £36 10s.; total, £53 6s. 2d. Preference to Durban, 6s. 10d.—1s. per ton. In taking these figures we have been dealing with an item that is classed at No. 2 rate in the railway schedule—on which rate this port enjoys a preference of 1s. 0½d., 2s. 0½d., and 2s. 0½d. respectively; and goods that travel under these tariffs will be cheaper still through Durban than this port by a further 3s., 1s. 3d. and 1s. 3d. respectively. We do not need to labour the point with your Excellency that if vigorous steps are not taken at once to remedy this very serious position the whole of our trade for the Competitive Area, in spite of the Mozambique Treaty, will be taken away, as given equal cost the question of time would alone be sufficient to give Durban all the traffic. We would point out that the foregoing remit hardly represents the actual position. In effect the primage, in so far as the Union-Castle Company is concerned, remains the same, with this difference, that a rebate of 5s. remains against this port, but is repayable at the end of the year 'to all loyal shippers.' We now understand that, on the representations that have already been made by the Governor-General on behalf of merchants and the port, there is every likelihood of Delagoa Bay being placed before long on the same basis as Union ports, viz., with 5 per cent. primage and therefore no rebate."

INVESTORS' DIARY.

The following company meetings have been announced:—

- Nov. 22.—Main Reef West; Consolidated Main Reef; Glyms Lydenburg.
- Nov. 27.—New Boksburg G.M.; Rand Klip.
- Nov. 28.—Transvaal and Delagoa Bay Investment Co., Ltd.
- Dec. 4.—Nourse Mines.
- Dec. 20.—Breyten Collieries; Elandsfontein Estate Co.

NOTICE.

NOTICE is hereby given that Mr J. Kenyon Kelty's connection with the firm of Spicers & Kelty, Ltd., terminated on the 1st August last.

NATHAN & NATHAN,

Solicitors for Spicers & Kelty, Ltd.,
Aegis Buildings,
Opp. Rand Club.

Wonderful progress is shown in the returns from Beira and Mozambique last year. The comparative figures from the Customs and port of Beira are as follows:—

	Customs.		
	1911.	1910.	1906.
Imports	637,859	619,452	238,922
Exports	588,072	530,108	133,901
Re-exports	385,236	246,150	204,187
Transshipment	1,084,948	733,435	676,044
Transit	1,543,330	1,226,710	618,933
Coasting	201,665	209,675	121,360

Port of Beira—Tons Cargo.

	1911.	1910.	1906.
Entered	123,675	100,465	41,821
Shipped	76,361	52,023	11,931

It will be seen that the total trade of the territory in 1911, as compared with 1910, increased by an absolute value of £879,199, representing an increase of 24·6 per cent. over 1910 and 122·8 over 1906. The increase of 1910 over 1909 was 24 per cent. Imports have only slightly increased to the amount of £18,407, a bare 3 per cent. increase over 1910, but showing an increase of 167 per cent. over 1906. Exports continue their steady advance, showing an absolute increase of £57,964 over 1910, representing 11 per cent., and an increase of 331 per cent. over the figures for 1906. Transshipment shows the greatest progress, and the figures should be a strong incentive to those projecting the Beira-Sena railway, since they chiefly represent that part of the trade of Zambezia which is transhipped at Beira. The absolute increase amounts to £351,153, which represents a 48 per cent. increase over 1910. Transit has also made great strides, its percentage of increase being a little superior to the percentage of general increase. In absolute figures the increase in transit amounts to £316,616 (less than the increase in transshipment), being 26 per cent. better than 1910 and 149 per cent. better than 1906. Port tonnage shows a great and steady increase, being 38,548 tons in excess of 1910. The total tonnage landed and shipped, 191,036 tons, shows that the port has more than trebled its cargo handled in three years, the tonnage for 1908 being only 62,407. It is somewhat of a triumph for the authorities to be able to take in 1911 three and a half times the cargo handled in 1908 with but very little increase in facilities in handling, this proving that for years back the Companhia de Moçambique was prepared for emergencies, the port of Beira having quite sufficient means to handle much more cargo than it does at present. The figures for 1912 from January 1 to September 30, are:—Customs: Imports, \$1,106,080; exports, \$773,133; re-exportation, \$616,158; transshipment, \$520,981; transit, \$2,084,533; inter-territorial, \$365,186. Port of Beira—Tons cargo: Entered, 96,369; shipped, 55,338½. The above figures are in mil reis—£1 equals 4 dollars 500 reis. Large tracts of land have been granted by the Companhia de Moçambique for agricultural enterprises, and the reports of the sugar factories established in the territory are most satisfactory. Over 25,000 tons of sugar will be exported this year, manufactured by the Sena Sugar Co., the Buzi Co., and the Beira Rubber and Sugar Estates, Ltd., the last-named being under the general management of Mr. Alfred L. Lawley.

The best "Reef Traveller" is the *South African Mining Journal*.

E. J. MOYNIHAN,

CONSULTING ENGINEER.

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CATALOGUES RECEIVED.

Davey, Paxman and Co., Ltd., Colchester.—A catalogue describing the Paxman modification of the well-known Lentz engine has been received from this firm of engineers. Since 1900, when the first Lentz engine was exhibited at the Paris Exhibition, where it was awarded the Grand Prix, and the inventor the gold medal, and, up to the end of 1910, the total horse-power made and supplied was over 3,000,000. The Paxman-Lentz type of engine is said to be particularly adapted for the high working pressures and increased temperatures of super-heat which are so necessary for economical working. A catalogue of the gas-engines and suction gas-producers, for which this firm have already established a reputation, has also been received. Both these publications should be in the hands of those whose power requirements are such as to make it important that the very best should be provided in the way of engines and accessory plant.

David Bridge and Co., Ltd., Manchester.—To think of friction clutches is to think at once of Messrs. David Bridge and Co., Ltd., Manchester, the patentees and sole makers of Heywood and Bridge's Patent Friction Clutches. These appliances have been successfully used for driving tube mills, and it is claimed that they will stop and start tube mills gradually from rest without shock or jar, and with a minimum of wear.

A. G. Thornton, Ltd., Manchester.—Messrs. Thornton, Ltd., Manchester, whose catalogues of scientific, civil engineering and surveying instruments are to hand, have acquired a reputation for this class of work which is world wide. The catalogues comprise everything in the way of theodolites and other measuring apparatus and accessories, which are used by surveyors, engineers, contractors and architects in every branch of their work, as well as barometers, rain gauges, hygrometers, etc. The scientific instrument department being constantly in touch with outside engineering advice endeavours to use the information obtained for keeping its productions up-to-date in every way.

When communicating with advertisers kindly mention the *South African Mining Journal*.

Situations Wanted.

ADVERTISER requires position as Mine Captain or Shift Boss. 18 years mining on Rand (Certificated). First-class references from Local Managers.—Apply F. W. B. this paper.

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by an energetic person who has been running his own 10 stamp battery, etc., for over 5 years. Strictly temperate, fair knowledge of gold recovery. Security available if necessary. Full particulars and photograph from "X. T.," c/o this office.

Automobile Notes.

The Perils of the Pedestrian.

The above formed the subject of an interesting and instructive article in a recent issue of a leading magazine, the writer having carefully arranged figures, in percentages, showing the relative danger in regard to the several classes of vehicles. For the benefit of motorists who may not have seen the discussion, it will be of interest to mention that, in London alone last year 410 persons were killed in traffic accidents, as against 107 in the previous year, a fact to which it would appear a peculiar significance attaches. The writer under review severely condemns the bigoted outcries raised against motor-cars, the erroneous impression having gained ground that these machines are responsible for the overwhelming proportion of street fatalities, and consequently inane suggestions for the governing of motor vehicles follow, which the writer, however, is also careful to deprecate. The illustrations drawn to assist in the study of the article in question, showing the right and wrong methods of crossing a street, the dangers from obscured tram cars and other vehicles, endorse the views so often expressed in these columns on the similar dangers, as they exist, though in a minor degree, in Johannesburg. The conditions of street traffic, however, obtaining in the last-mentioned place, scarce permits any comparison being drawn, and while welcoming any suggestions whereby street dangers can be minimised, one must recognise the fact that methods for the control of traffic, admirably adapted in the case of London, for example, would signally fail here, owing to the gross lack of intelligence, coupled with an utter disregard for other road users, which characterises the native driver, representing, by the way, the class to whose charge is committed about 75 per cent. of vehicles, other than mechanically propelled. To the rashness of the coloured driver, therefore, whose depredations are too well-known to require comment, can be attributed the bulk of accidents which occur to the pedestrian in Johannesburg, and until stringent measures are introduced to deal with his inconsiderate behaviour, so long will the chapter of street accidents continue to be supplemented.

Drought and the Roads.

The road problem in South Africa has presented difficulty of solution, even under the more favourable weather conditions which usually prevail, and it is not a matter for surprise, therefore, that the prolonged drought should render it acute. Perhaps at no other time in recent years have the roadways of the country suffered to such a serious extent as has been occasioned by the exceptional spell of dry weather. The disintegration of the district roadways in particular is very marked at the present time, and, owing to many of these being allowed to remain out of condition so long, the damage, which surface attention, say, with tar veneering, would have avoided, has assumed serious proportions. In Johannesburg the position of streets not treated with asphalt is such that the breaking up process may be said to be complete in the absence of systematic street watering, and much expense will be entailed before normal conditions are made possible. Many people are of opinion that the automobile is responsible for much of the road deterioration which goes on, and argue that the taxation imposed is quite consistent with the destructive nature of this particular machine. Motorists, however, so often placed in unfairly saddled circumstances, will be interested to learn that the views of those qualified to speak on road destructiveness, are practically unanimous in that the damaging effect of the automobile is grossly exaggerated, and that streets treated with genuine asphalt are unharmed by the operation of ordinary motor traffic. In the case of the water-bound road, however, expert opinions are not favourably inclined towards the motor vehicle.

The work of the Road Board in the United Kingdom, it may be mentioned, is of an excellent character, despite the flood of criticism to which it has been subjected. The dust problem appears within solution by the tar-surfacing of all roads, a gigantic task, which, however, the Board has determined is the only effective remedy to combat this nuisance. The authorities responsible for the road system of this country might profit from the example thus set, and lessen the evil, which, when comparisons are attempted, is more pronounced here than in Britain.

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Try a set and prove it for yourself.

"Cost a little more to buy, cost a lot less to use."

Taxation of Cars.

In view of the motor legislation to be introduced shortly to the Union, the question of old cars and taxation should be taken up by the several automobile Associations. At present no distinction is made in the case of old motor cars in the tariff of licences for private vehicles, which ranges from £3 10s. for cars up to 6½ h.p. to £10 for those over 40 h.p. It is an accepted fact that consequent to wear and tear and other causes, the h.p. possible from engines of cars, say, four years old, bears no comparison with the modern cars of the same R.A.C. rating, and it is pointed out that the disproportional amount of the tax, in point of the second-hand value of many cars, militates strongly against their sale. Other considerations which the R.A.C. based their recommendation upon, when approaching the Treasury some time ago on this important question, were that "the old car is of less value to the owner; it accomplishes less mileage, and is usually employed for local and not for general touring purposes; it is wasteful in petrol, and, therefore, pays additional tax for this reason; and the fact that many old cars at present in disuse would be brought into use."

"Here and There."

The "Paige-Detroit," the latest addition to the numerous American-built cars in use in Johannesburg, is likely to confirm all it professes to be. The agents fittingly describe it as a machine for town or country, embodying strength, reliability and simplicity. Already it is understood this car has been tested by hard service in the country districts of the Transvaal and Orange River Colony, and its claim to recommendation to the mining community will doubtless

soon be apparent. The car, which is being specialised in, is one of 25 h.p., and establishes no precedent in point of high price, rather comes within the reach of all.

Attention of local motorists is drawn to the fact that the Johannesburg Vulcanising Works are now occupying their new premises at the corner of Loveday and Marshall Streets, the old premises at this place having been rebuilt. The J.V.W. are the premier repairing firm in South Africa, and possess the largest and most up-to-date plant in the country.

The South African prospective buyer should bear in mind that the demonstrator will naturally take particular care to bring out the best qualities in the car. Should the machine, for example, evince any particular weakness on hills, those of a steep grade nature will be avoided, and a moderate incline be included in the demonstration programme. Similarly, if the springing be faulty, smooth roads will be chosen, and so forth. The purchaser should select his own course, and satisfy himself accordingly on the respective qualifications which a machine embodies.

The Olympia Show, which opened last Saturday, it is anticipated, will decide very largely the running fight so long waged between the British and American manufacturer of the small cars. The intention of the last-named maker to push the cheap car trade in England and the Colonies was never more determined than at present, and to accomplish this purpose is prepared to still further cut prices. The British manufacturer, on the other hand, it would appear, treats the situation with a certain *sang-froid*, confident of winning out in the public favour, by reason of the longer life which characterises his production, tantamount to a lower ultimate cost.

A certificate has been awarded Mr. S. F. Edge, of Napier fame, by the R.A.C., for his performance in a recent trial with a car of the well-known make he represents. The distance covered was 795 miles, and was accomplished (running time only) at an average speed of 18.76 miles per hour. The car was driven throughout the entire run, London-Edinburgh-London, on top gear, the low gears not being used at

Dunlop Repair Shop

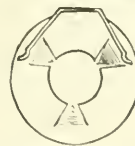
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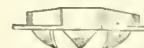
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any time. The petrol consumption is given at 27.65 miles per gallon. "Thus," the report adds, "has another feather been added to the Napier cap."

* * * *

The gradual disappearance of trapping in England—only a few counties now recognise the system—should impress the South African authorities with the reasonableness of adopting a similar attitude, and confining their attention, say, to reckless driving at certain recognised points of danger, when offenders could be apprehended, and dealt with on the evidence of the police officials in whose opinion driving to the public danger was established.

* * * *

On many of the more recent Colonial models several departures from standard practice, such as the position of the magneto, high above the engine, to permit of the car fording streams, are noticeable, which illustrates the attention which is being directed to vehicles for the Colonies, and the importance of the field created in the motor industry beyond the seas.

Contracts Open

- The South African Railways and Harbours Administration invites tenders for the earthworks between 2 miles 25 chains and 4 miles 24 chains (in two sections) and between 9 miles 20 chains and 14 miles (in two sections) on the Gamtoos-Patentie Railway. Each contract comprises about 45,000 cubic yards of excavation (November 20).
- The Railway Administration invites tenders for platelaying and ballasting of Caledon-Kykoedie Line from mileage 0 to mileage 15 (approximately) (November 18).
- The South African Railways and Harbours invite tenders for the supply of the following:—(a) 12,000 tons pea coal for Electric Light Works, Capetown; (b) 2,968 tons pea coal for Electric Light Works, Port Elizabeth; (c) 3,600 tons pea coal for Electric Light Works, East London; (d) 504 tons steam coal for Electric Light Works, Port Elizabeth; (e) 25,400 tons mnt, pea, dross, and household coal for Natal Province (Nov. 19).
- The Municipal Council of Johannesburg invites tenders for the erection of fencing and gates at Parkview Square and portion of Newlands Square, Johannesburg (November 22). Also for the supply of the following:—(a) Water piping and fittings: Contract No. 588; (b) electric cable, earthenware troughs, porcelain bridges, copper wire, cut-outs, bitumen and pitch: Contract No. 591; (c) cast iron feeder pillars: Contract No. 593; (d) cast iron kerb inlets: Contract No. 594; (e) felloes, spokes, circle plates, and shackle plates: Contract No. 595; (f) solid rubber tyres: Contract No. 596 (November 22).
- The Municipality of Benoni invites tenders for the supply and delivery to Benoni of:—4,000 ft. 7/22 two-core electric cable, 4,000 ft. 7/20 two-core electric cable, 2,000 ft. 7/18 two-core electric cable, 2,000 ft. 7/16 two-core electric cable, 200 electric cable tee boxes, 300 electric cable end boxes, 200 electric cable two-way fuse boxes, 200 electric cable meter board fuse boxes (November 20).
- The Benoni Municipality invites tenders for:—(a) Erection of abattoir buildings, excluding structural steelwork, main roofs and equipment: Contract No. 2; (b) erection of structural steelwork, main roofs and equipment: Contract No. 3 (November 20).

Glynn's Lydenburg, Ltd.

(Incorporated in the Transvaal.)

Notice to Shareholders.

NOTICE is hereby given that the adjourned Fifteenth Annual Ordinary General Meeting of Shareholders will be held on FRIDAY, 22nd NOVEMBER, 1912, at 12 o'clock Noon, in the Board Room, The Corner House, Johannesburg.

By order of the Board,

W. RUSSELL SLACK,
Secretary.

The Corner House,
Johannesburg,
8th November, 1912.

48138

St. John Ambulance Brigade.

The distribution of First Aid Certificates to the officers and employees of the Bantjes Consolidated Mine, Florida, who had been successful in passing the examination prescribed by the mining regulations, took place in the Mine Boarding House on the 7th inst., there being an attendance of about forty. Mr. W. W. Lawrie, the manager of the mine, was in the chair. The whole of the number who attended the class passed the examination, reflecting great credit on their instructor, Dr. W. P. Johnston. Certificates were handed to the following gentlemen: Messrs. Joseph Henry Mark, Joseph Fidler, Sequin Fisher, William McKenna, James Bolland, Godfrey J. Watermeyer, James Duff, Robert Croxford, Arthur S. Gibson, George Wilson, Robert G. Morgan, William Kelly, Edwin Gregor, Louis Dawson Campbell, Thomas Herbert Clayton Garner, Arthur Hall, Frederick Cindel, Arthur H. Nesbitt, Thomas Fletcher, Walter S. Vincent Price, Charles N. Krone, Robert Murdoch, William Gregor, John Henry Brown, James Anderson, William Harold Fidler and Charles Wilson Herald. On behalf of the class the Chairman presented Dr. Johnston with a case of medical instruments, and to Mr. Arthur Hall, the Compound Hospital Orderly, a valuable set of toilet requisites, at the same time eulogising the services they, together with the energetic Hon. Secretary, Mr. C. W. Harold, had rendered to the ambulance cause on the mines. Mr. V. E. Davis, the Acting District Secretary, attended and explained the necessity for those who had gained First Aid Certificates to form themselves into a division of the St. John Ambulance Brigade, in order to maintain and put to the best practical use the knowledge acquired, with the result that the majority of those who had received First Aid Certificates allowed themselves to be enrolled as a division of the Brigade, thus becoming one of the senior of the many mining divisions which at present are in the course of formation.

The S.A. Mining Directory.

The *Transvaal Leader* says:—A handbook which will be of the greatest utility to mining people as well as the general public has been issued by the *S.A. Mining Journal*. It is called *The South African Mining Directory*. It deals with the mining districts of the Rand, Rhodesia, the Free State, the Cape, and Natal, and includes the coal, the gold, and the diamond industries. It gives an accurate list of the principal officials, from the manager downwards, and arrangements have been made to issue it monthly, so that the changing character of the personnel of the mines may be dealt with. Complete and revised lists are included of all the officials and members of the various organisations connected with the mines, such as the W.N.L.A., the New Labour Recruiting Corporation, and public bodies such as the S.A.R. and Union Mines Departments. The significance of the publication to merchants, agents, storekeepers, and the whole business community that has daily dealings with the men in positions on the mines, needs no emphasis. In a hundred different ways and in a hundred different spheres of business, the work will be found invaluable for everyday use. To merchants and agents anxious to circulate the mines and to ensure that their circulars come under the personal notice of the leading officials, the accuracy of the directory will prove of the utmost importance. And then there is the utility to business men of acquaintance with the names of the actual holders of the more important positions on the mines. Business men will also recognise the importance of knowing the correct telephone numbers, addresses and designations of the leading officials.

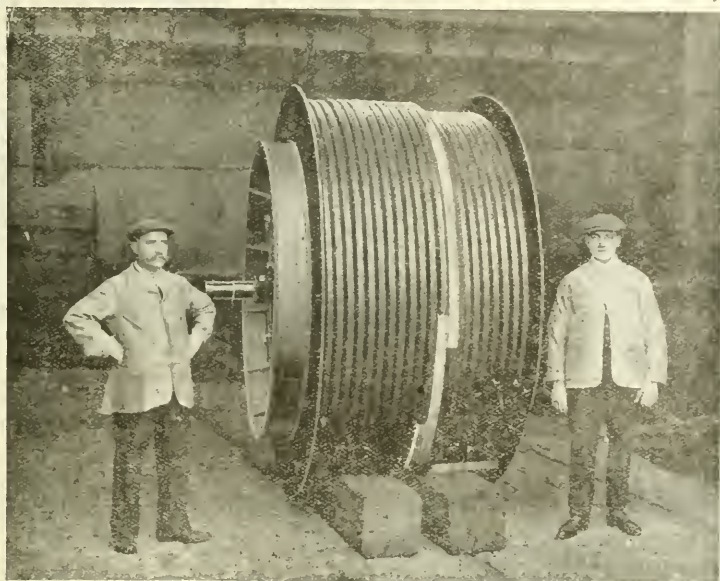
The Special 21st Anniversary Number of the "South African Mining Journal" is now on sale at the various branches of the Central News Agency. The number is, of course quite distinct from the ordinary weekly issue of the paper, and is published at 3s. 6d. per copy. All orders will be executed by the Central News Agency.

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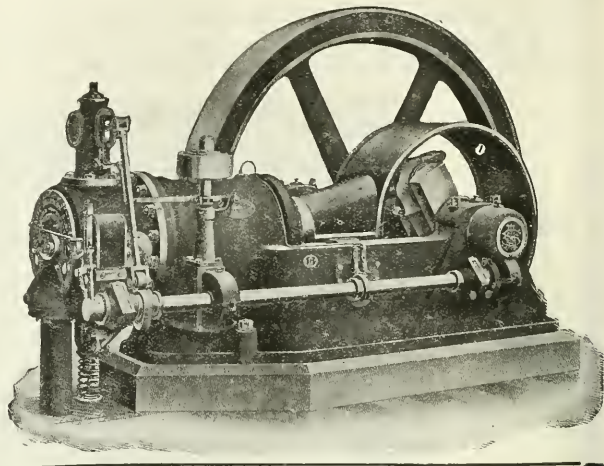
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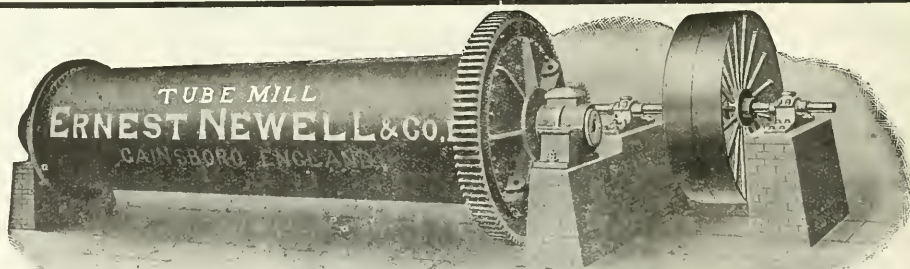
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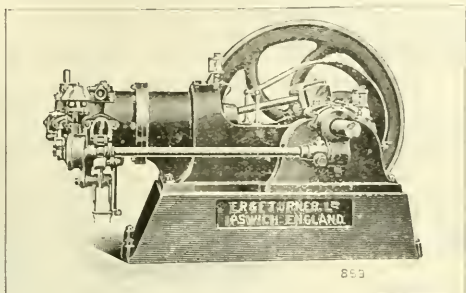
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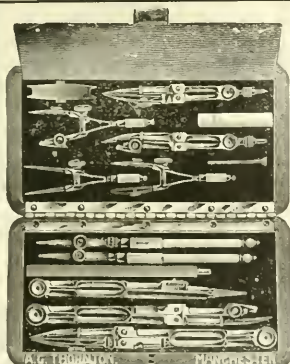
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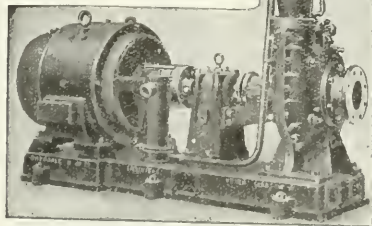
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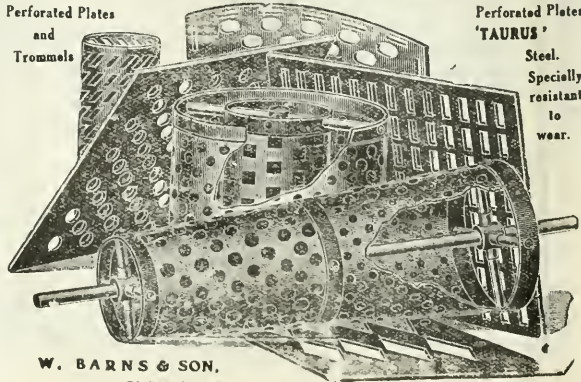
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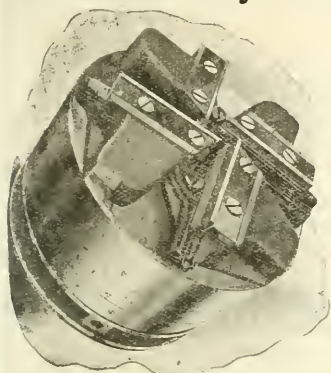
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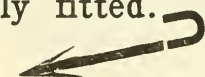
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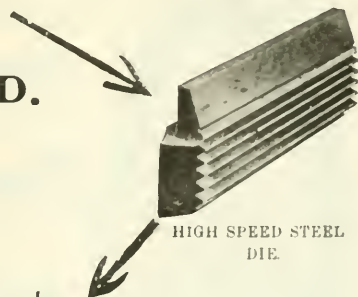
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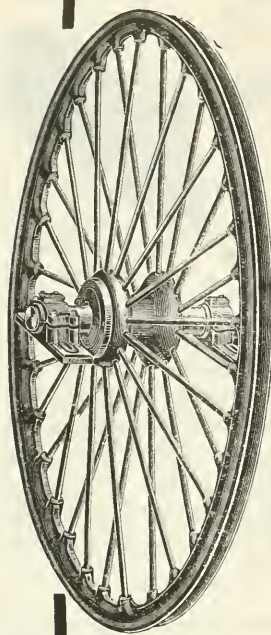
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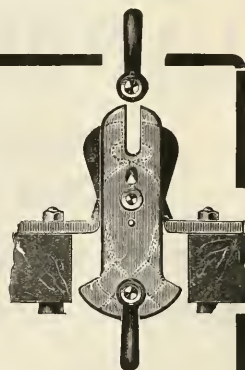
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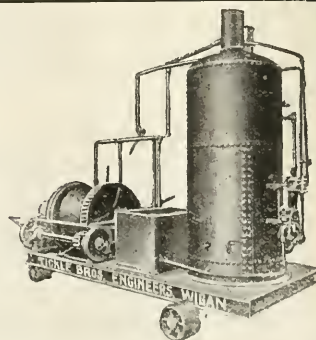
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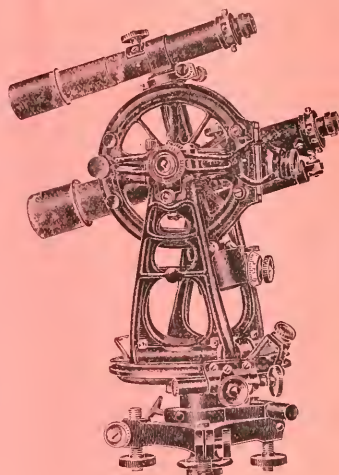
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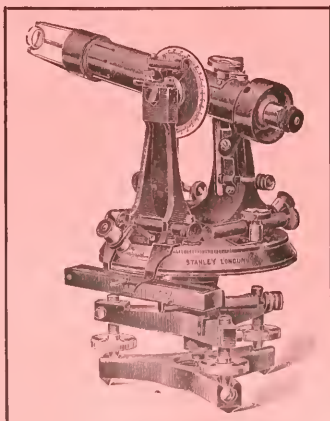
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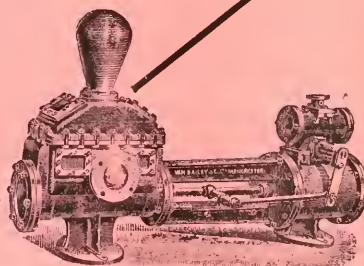


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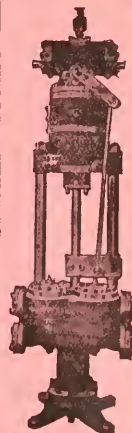


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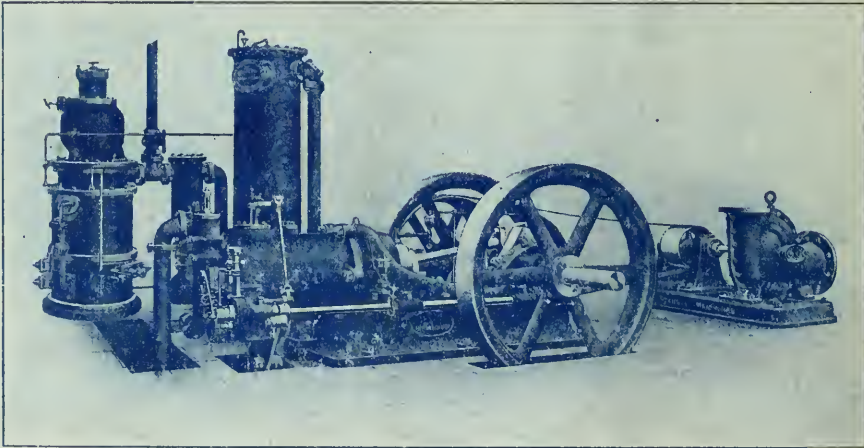
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